ARCHIVES OF OPHTHALMOLOGY.

ON SPONTANEOUS AND POST-OPERATIVE DETACHMENT OF THE RETINA IN MYOPIC EYES.

By PROF. CONRAD FRÖHLICH, BERLIN.

Translated from Germ. Ed., vol. xxxviii., 1, 1898, by Dr. WARD A. HOLDEN.

SINCE the publication of my results in the operative treatment of fifty myopic eyes, I have performed six more operations. In five of these there were no unusual features and the results were satisfactory. In the sixth case detachment of the retina followed the operation.

The history of this case is as follows:

W. P. a student, aged eighteen. R. with — 14. D, V = $\frac{1}{6}$. Refractive media clear. A moderately large staphyloma posticum with a black margin. The macular region exhibited some superficial white stripes. As the conditions were favorable I agreed to the desire of the boy's father that his myopia be removed so that he could follow the course he had undertaken.

November 11, 1897.—Discission was done with a needle, the anterior capsule being divided crucially. After this there was moderate swelling of the lens, and some flocculent masses sank to the bottom of the anterior chamber. Slight ciliary injection.

November 21st.—The entire lens opaque. Pupil dilated ad maximum. Linear extraction upward, the lance being entered 2 *mm* from the corneal margin. A large portion of the lenticular débris evacuated. No prolapse of iris or vitreous.

The eye gradually became pale. Tremulous particles of lens matter filled the pupil. The iris retracted ad maximum.

December 4th.—Paracentesis of the anterior chamber for removal of the remainder of the lens. The lance entered 1.5 *mm* from the outer margin of the cornea. The lens masses escaped from the eye. Pupil black. After removal of the speculum a small bead of vitreous presented in the wound, but returned spontaneously.

December 15th, the day of the patient's discharge, I found a round pupil almost wholly black. In the temporal portion lay the capsule of the lens from which a gray strand ran obliquely before the iris to the corneal cicatrix on the temporal side. Eyeball pale.

A letter from the patient the first of January, 1898, was very favorable, but another at the end of January stated that objects appeared crooked and oblique. An ophthalmoscopic examination in February confirmed my fears. In the lower portion of the fundus was a detachment of the retina. The tension was diminished.

Was the detachment due to the operation?

Those authors who would deny the connection must attribute the detachment to accident or previous disposition.

There is, however, no reason for ascribing to this eye a particular disposition toward detachment. The eye was not particularly diseased; the vitreous was free from opacities, and, as the prolapsed bead showed, not fluid. Nor did the moderately large staphyloma posticum or the superficial changes at the macula indicate excessive stretching of the coats of the eye or unusual inflammatory processes. I have operated on many eyes that were more highly disorganized without having detachment follow.

It only remains, then, to blame the incarceration of the lens capsule in the corneal wound at the second paracentesis for the unfortunate outcome.

The seven weeks that intervened between the operation and the detachment may seem a long time, but I have seen as long a time elapse in other cases. In two cases that I have already reported, the detachment came on in one, six weeks after the last operation, which was complicated with prolapse of vitreous, and in the other five weeks after the last paracentesis, which was followed by incarceration of capsule.

In looking through the cases reported by Otto[1] from Sattler's clinic, I find that in Case 28 the vitreous prolapsed during a linear extraction and detachment of the retina followed in five weeks; in Case 54 there was prolapse of vitreous

[1] *Arch. f. Ophth.*, xliii., 2.

and detachment of the retina four and one half months later; in a third case the vitreous presented twice and detachment followed in nine weeks.

Schreiber[1] also reports a case in which during linear extraction the conjunctival sac was flooded by the very fluid vitreous and detachment occurred six weeks later.

I shall limit myself to an analysis of these seven cases, from which it appears that twice a tag of lens capsule got into the corneal wound, and that five times vitreous prolapsed, and further that in all there was a considerable lapse of time before the eye was ruined by the occurrence of detachment. It is believed that this interval of time is too great to warrant the idea that the detachment is dependent upon the operative interference. It is indeed from a mechanical view-point incomprehensible that an incarceration of capsule or a prolapse of vitreous should at once cause detachment. For the quantity of prolapsed vitreous is small, and it lies between the lips of the fresh corneal wound only as a foreign body that delays the healing of the wound. But when the lips of the wound unite, the vitreous included between them becomes organized and takes part in the formation of the scar, and as the scar itself retracts it may on account of its fixed attachment exercise traction upon the retina.

Not only do these seven cases indicate that a considerable amount of time must elapse before the wound becomes firmly united, but we have an analogous situation in scleral injuries that are complicated with prolapse of vitreous. Here also the course of the healing is at first favorable, but some months later a detachment of the retina develops in connection with the scar. A series of such cases was reported by Horstmann[2] and myself. This author,[3] in his paper on myopia, also, in speaking of the causes of detachment, stated that in four highly myopic eyes from which vitreous was lost in cataract extraction the retina became detached in all, in two cases eighteen months later, and in two six months later.

[1] *Festschr. z. F. d. 50. Bestehens d. med. Gesellsch. z. Magdeburg.*
[2] *Arch. f. Augenheilk.*, xxxvi., p. 193.
[3] *Arch. f. Augenheilk.*, ix., p. 218.

Leber[1] says, furthermore, that after incarceration of vitreous in wounds of the cornea or sclero-corneal junction in the course of operations, a connective-tissue organization of the prolapsed part may later cause traction to be exerted, detaching the retina.

A further argument for the independence of detachment and operations for myopia is that the detachment may be the result of the myopia alone. This argument would be of value if it could be shown that detachment was no more frequent in operated eyes than in similar eyes not operated upon, but according to my own statistics the percentage is much higher in the operated eyes, a point which I shall take up more in detail later.

For this reason alone it seems to me to be much more probable that post-operative detachments, coming on some time after an operation complicated with incarceration of lens capsule or with prolapse of vitreous, are not to be regarded as idiopathic. Of course, not every prolapse of vitreous is followed by detachment. In proportion to the number of cases in which prolapse occurs, everywhere estimated at 20 per cent. (Sattler), the number of detachments is small. The consistency and size of the prolapsed portion, the extent and direction of the corneal wound, the size and strength of the vitreous band, the condition of the interior of the eye, and other factors, may well have much to do with the development of detachment.

Among fifty-six eyes operated upon I have had detachment four times. One case was due to infection, the other three were due to the operation directly. My percentage is 5.3; other operators have had a somewhat higher or a somewhat lower percentage.

The necessity of determining the percentage of detachment in cases not operated upon is evident, for Otto says that, if it is shown that the operation increases the percentage of detachments, it must be given up. This I cannot agree with, for it is possible that further modifications of a comparatively new operation will give us better results. The difficulty of obtaining correct statistics, however, is very great.

[1] *Graefe-Saemisch*, vol. v., 2, p. 699.

Otto has concluded, from a study of the records of the Leipsic clinic, that the real percentage of detachments in highly myopic eyes is from 3.67–4.72. The percentage is always higher in private practice.

One reason why it is hard to determine the exact percentage is the fact that a number of spontaneous detachments are masked by complicated cataracts or by phthisis of the ball. Furthermore, not every detachment in a highly myopic eye can be considered to be due to the myopia, for some of these detachments may prove later to have been caused by tumors and the like.

Finally, there is another point to which Mooren called attention, viz., that the patient with detachment of the retina consults a physician at every opportunity, while comparatively few of the myopic seek medical advice, and in this way misleading statistics are made up.

It is difficult also to learn the true percentage of detachments after operation, for undoubtedly, as Hirschberg and Gelpke remark, some of these are overlooked or not reported.

Furthermore, the percentage of detachments in highly myopic eyes has been based on statistics of persons of all ages, but the patients who have been operated on are in the great majority of cases under twenty-five years of age, and we have not yet followed these patients long enough to make the two categories correspond. And only after the lapse of decades shall we be able to decide whether the operation tends to lessen the liability to detachment after forty years of age, the period when it is most likely to occur in eyes that have not been operated on. At present the question to be decided is, How frequently does detachment occur in highly myopic eyes between the ages of ten and thirty?

From my policlinic books I have collected all the cases of unilateral or bilateral myopia of 10. D or over. Between January, 1883, and January, 1898, there were, leaving out the forty cases that were selected for operation, 1193 persons with myopia of 10. D or more among 80,682 patients. Thus 1.5 % of the total number had myopia. The 1193 patients had 1957 eyes with high myopia. The following

table shows the ages of the patients, their number, the number of eyes, and the number of detachments.

Age.....	-10	11-20	21-30	31-40	41-50	51-60	61-75	Total.
Number of patients.	21	400	359	180	141	67	25	1193
Number of eyes.....	40	1280		637				1957
Number of detachments.....	0	16		27				43

From these figures one sees that the number of persons under ten is very small, and that it increases greatly up to the thirtieth year. From thirty it gradually falls to the fiftieth year, and then decreases rapidly to the seventy-fifth year. Similar results were found by Ott and Leininberg.

The detachment in my cases and in those of Ott and Leininberg was always unilateral, although among 1158 cases of detachment, with myopia in 918, Galezowski found detachment in both eyes in 29 cases.

Ruling out cases of complete detachment in which the refraction could not be determined, I found 2.2 % of detachments in highly myopic eyes. These figures agree fairly well with those found by others, and if we compare them with the figures for detachment in cases of myopia of any degree, it appears that the percentage is little if any higher in myopia over 10. D than in myopia in general.

In reality the percentage is higher than 2.2. If I include all the complications, such as complicated cataract, phthisis bulbi, and amaurosis, the number of which was about 50, the percentage then lies somewhere between 2.2 and 4.5, and it is impossible to determine exactly what it should be.

In collecting the cases of detachment I have noted the age, since the statements in this regard differ. Ott estimates the average age of such persons as 38.9 years, and concludes that detachment is not to be regarded as an affection of advanced age. Schweigger also concludes from his statistics that myopic detachment is scarcely an affection predominating in old age. Donders stated, on the contrary,

that the vision was often lost by detachment at the age of fifty or sixty years, if not earlier. Walters's tables showed that not less than 52.9 % of the detachments occurring in high myopia were after the age of fifty. According to Poncet most detachments occur between forty and seventy.

If I divide the decades in my table into two groups, taking thirty as the dividing line—so as to obtain a category corresponding to the young myopes operated upon—the persons under thirty number 780, with 16 detachments, and those over thirty number 413, with 27 detachments. The percentage then would be, under thirty, 2; over thirty, 6.5.

The reports of detachment after operations for myopia are as follows:

Gelpke's collection....	254	eyes with	9	detachments.	
Gelpke's own cases....	15	" "	0	"	
Schreiber.....	19	" "	1	"	
Darier.....	142	" "	4	"	
Blessig.....	30	" "	2	"	
Schmidt-Rimpler.....	12	" "	0	"	
Fröhlich.....	56	" "	3	"	
Total.....	572	eyes with	19	detachments, or 3.3 %.	

This percentage corresponds fairly well to that of detachment in high myopia as found by many writers. But if we take the figures for myopia with detachment before the age of thirty the percentage is much lower. Thus in my table there were 759 persons with high myopia between the ages of ten and thirty, and 16 of these had detachment—a percentage of 1.25.

These figures show that detachment after operation is much more frequent than when no operation is done.

There is a further loss of eyes from infection. Gelpke's collection shows 2.7 % of loss from infection. We can now add later statistics to these:

Gelpke's collection.....	254	eyes with	infection	in	7
Gelpke's own cases.....	59	" "	"	"	1
Schreiber.....	19	" "	"	"	0
Darier.....	30	" "	"	"	1
Blessig.....	30	" "	"	"	1
Schmidt-Rimpler.....	12	" "	"	"	0
Fröhlich.....	56	" "	"	"	1
Total.....	572	eyes with	infection	in	11, or 2.2 %.

The total loss from detachment and infection is therefore $3.3 + 2.2 = 5.5$ %.

All new departures in surgery cause a sacrifice. Still the course may be proper, and an improved technique may later bring down the percentage of losses.

I would mention that in my last three cases I have given up the crucial incision that I formerly made and have substituted the simple incision, as recommended by Fukala, Mooren, and Schnabel. The crucial incision leaves four movable tags, which in the paracentesis more readily become incarcerated than the edges of a simple incision. I now make a horizontal incision low down, so as to be as far away as possible from the linear section which I make in the upper part of the cornea.

ON A CASE OF PAPILLO-RETINITIS DUE TO CHLOROSIS.

By Dr. W. SCHMIDT,

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Translated by Dr. WARD A. HOLDEN.

(*With two charts of the visual field on Plate VI., of Vol. XXXIV., German Edition*, 1897.)

SINCE two rare cases of optic neuritis were published independently of each other in the same number of the *Deutsche med. Wochensch.* (No. 28, 1896), I am led to record the clinical history of a similar case which was at that time under treatment in this clinic. The case is of interest, as it is in almost all respects similar to that reported by Dieballa, while the case reported by Schanz is in its etiological features of value in judging our own case.

A girl of fourteen came to the clinic June 8th, with the complaint that her vision was not so good as formerly. As a child she had had no severe illness except measles, and tonsillitis at times. Her father died of an injury; her mother is living, but formerly was epileptic. The patient's vision was good until recently. About a year ago she began to have pressing and boring pains of varying intensity in the head, which could not always be localized, but sometimes occurred in the temporal regions and more frequently at the vertex. At Christmas in 1895, vomiting and giddiness came on daily after meals, the patient noticed a beginning failure of vision, and there was some spasmodic stiffness of the limbs.

St. pr.—Patient is of medium size, well developed for her age, and of anæmic appearance. The lips and conjunctiva are pale.

The condition of the eyes is as follows: Refraction, by skiascopy, R + 4, L + 3; R V = $\frac{6}{60}$, with + 1.75 $\frac{6}{24}$; L V = $\frac{6}{24}$, with + 1.75 $\frac{6}{15}$.

Ophthalmoscopically, right, the disc is greatly swollen and enlarged. The margins are not sharply outlined and the entrance of the vessels is obscured. The veins are dilated and tortuous, the arteries thin. There are a few small hemorrhages and sharply-outlined white plaques of different sizes scattered over the retina, and about the macula in a semicircular zone is a sprinkling of small glistening points and patches.

In the left eye the changes are similar but less pronounced.

On both sides the vessels bend back at the margin of the disc, but not abruptly, and the swelling of the disc passes over gradually into the normal level of the fundus. The difference in level corresponds to 2. – 3. D.

Diagnosis: Papillo-retinitis of each eye. The retinal picture, with the radially arranged groups of white dots about the macula and the larger white patches scattered over the fundus, suggested albuminuria, but neither albumen nor sugar was found in the urine at any time.

The constant headache then suggested a cerebral origin for the retinal trouble, but an examination in the medical clinic revealed no abnormalities on the part of the nervous system. There were also no evidences of hereditary syphilis.

Since the etiology of the condition was not clear, the patient was put on iodide of potassium, iron, and a strengthening diet. In a short time the general condition improved and the headaches diminished. The vision at first grew worse and then began to improve. Later the headaches returned and the patient was again sent to the medical clinic, where the diagnosis "hysteria" was made.

The vision gradually improved. There was, however, a broad ring scotoma for all colors and a slight peripheric contraction of the visual field.

The patient was sent a third time to the medical clinic, July 17th, because it seemed that the persistent anæmia might have something to do with the retinal condition. An examination of the blood then showed that it was a pure case of chlorosis. The hæmoglobin was diminished while the number both of red and of white corpuscles was normal.

Hæmoglobin	56 %
Red blood corpuscles	6,120,000
White blood corpuscles	8,000

The iodide was now discontinued, the iron increased, and the patient was kept in bed. In a short time the general condition improved, and July 25th the blood showed :

Hæmoglobin	66 %
Red blood corpuscles	5,760,000
White blood corpuscles	8,400

July 31st.—The body weight had increased five pounds and the blood showed :

Hæmoglobin	82 %
Red blood corpuscles	4,680,000
White blood corpuscles	10,800

Ophthalmoscopically the discs were less swollen, of more nearly normal color, and fairly well outlined. No hemorrhages. The white patches were smaller, and the fine stippling about the macula was less pronounced. Vision $\frac{6}{9}$. The headache continued, but was not so severe and was no longer constant.

August 8th :

Hæmoglobin	95 %
Red blood corpuscles	4,760,000
White blood corpuscles	8,400

Ophthalmoscopic picture unchanged, general condition good, no headache.

August 14th.—All of the retinal changes less marked. The visual field, however, still showed a ring-shaped relative scotoma on each side (see Plate VI.).

August 21st.—V = $\frac{6}{9}$ each ; visual field as before ; ophthalmoscopic changes less marked. Patient discharged.

August 23d.—The patient returned with the statement that it had "suddenly become black before her eyes," and that there had been headache and vomiting. No ophthalmoscopic changes could be found, and the acuteness of vision was rather better than before.

As the patient when finally dismissed had normal vision and the general condition was much improved, the papillo-retinitis could be considered cured. Since that time the patient has not returned.

The questions which naturally present themselves are: "Was the chlorosis really the cause of the papillo-retinitis?" and "How is this to be explained?"

As stated above, our first suspicion was of albuminuria, but repeated examinations of the urine failed to reveal either albumen or sugar.

The continuous headache in the beginning suggested a cerebral cause for the papillitis, and for several days the patient definitely located the seat of the pain at the vertex, and an area here was sensitive to percussion. Later she contradicted herself, did not complain spontaneously of headache, and when questioned located the pain first at one spot and then at another. These symptoms suggested hysteria rather than an organic cerebral affection. The diagnosis of hysteria was made in the medical clinic also. The sensibility of the throat and corneas was reduced, there was ovarian pain, and the patient's description of her symptoms seemed exaggerated. Furthermore, the acuteness of vision varied without changes in the fundus, and the visual fields differed at every examination, so that it was long before a fairly constant condition could be mapped out, such as is shown in Plate VI. Apart from the scotoma, the limits of the color fields showed a partial reversal of sequence which also suggested hysteria.

But, finally, although there were no other marked general disturbances, and she had had no hemorrhages, in fact had not even menstruated, we were forced to the conclusion that this was one of the rare cases of papillitis dependent upon chlorosis. The results of treatment directed toward the chlorosis, and especially the improvement in the eye symptoms, verified the diagnosis.

The author then refers to cases similar to his own reported by Dieballa, Bitsch,[1] Gowers,[2] Williams,[3] and Mackenzie.[4] Dieballa believes that the increased deglobulization is the true cause of the papillo-retinitis, and the author agrees with him. Taking up for comparison cases of transient

[1] *Klin. Monatsbl. f. Augenheilk.*, xvii., p. 144.
[2] *British Med. Jour.*, 1881, 1, p. 796.
[3] *Ibid.*, 1884. 1, p. 10.
[4] *Ibid.*, 1885, 1, p. 328.

blindness during lactation, the author agrees with Heinzel[1] that, as neuritis is caused by lead, arsenic, alcohol, quinine, tobacco, and the toxines of syphilis and tuberculosis, it is likely that in lactation at times altered metabolism leads to the production of toxines which cause optic neuritis. He quotes Nettleship,[2] however, as saying: "We may fairly assume that these rare cases are to be grouped rather with optic neuritis which is sometimes seen in chronic anæmia than with any other form of neuro-retinitis caused by the retention of injurious substances in the blood."

In conclusion, the author expresses his thanks to Professor Sattler for assistance in his work.

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[1] *Beitr. z. Augenheilk.*, xiii., p. 99.

[2] *Royal London Ophthal. Hospital Reports*, xiii., p. 97.

(Oliver has since reported in detail the eye changes in six cases of anæmia of various sorts.—*Trans. Amer. Ophth. Soc.*, 1897, and *Annals of Ophth.*, 1897. —TRANS.)

CONTRIBUTIONS TO THE EMBRYOLOGY OF THE LENS.

By Dr. C. RITTER, Bremervörde.

Abridged Translation by Dr. Ward A. Holden.

(*With six figures on Plate X. of Vol. XXXIV., German Edition*, 1897.)

I.—THE FORMATION OF THE MIDDLE OF THE LENS.

AFTER occupying myself for a long time with the development of the lens I still find many problems unsolved. My investigations have been confined to the lenses of fishes, amphibians, and reptiles. In these classes the relations of the lens fibres are simpler and easier to understand.

In beginning my descriptions with the middle of the frog's lens I wish first to correct a former error. Many years ago I discovered that there were nucleated, irregularly formed fibres in the middle of the frog's lens, and since similar but non-nucleated fibres were found here in other animals I was led to believe that there was a formative centre in the middle of the lens. Henle and O. Becker quickly disproved my views and I myself gave them up.

These nucleated fibres are not found in the lenses of all grown frogs, but the same curious forms are found here in every frog's lens. Henle pictured these in his work, although nuclei were not present as in Figs. 1 and 2, Pl. X. The middle of the frog's lens is entirely formed of these irregular fibres. When we examine the centre of the lens in frog larvæ we find these same fibres. Fig. 1, Plate X., is from the full-grown frog, Fig. 2 from the larva. For the most part,

the fibres are broad in the middle and pointed at each end. In the larvæ all are nucleated, in the grown animal only a part. It is known, however, that the nuclei of the nerve fibres disappear with age. But since exactly the same forms of fibres are found in the middle of the lens both in the larva and the full-grown animal we must conclude that the lens fibres of the frog last through life. A regeneration of these cells seems to be impossible. This view may be held by many histologists but it has never been expressed. However, I have found one exception that to my mind throws doubt upon this conception as a general rule.

A very interesting object is the lens of the young eel. At the age of two months the eel is 10 *cm* long and the spherical lens is 0.9 *mm* in diameter. It is composed of layers of lens fibres, the inner fibres being narrower than the outer. The outer fibres attain, in the region of the equator, an excessive breadth, being sometimes as wide as 0.04 *mm* (Fig. 3). They contain very large oval nuclei.

According to the theory previously mentioned, these fibres should be found also in the lens of the full-grown eel. The lens in the full-grown eel is 3 *mm* in diameter and perfectly spherical. In the peripheric fibres are found well marked nuclei corresponding to those found in the peripheric fibres of the lens in the young eel. But nearer the centre of the lens no nuclei are found and the fibres are very much narrower and have notched margins (Fig. 4). So in this case at least the theory that the lens fibres when once formed remain at the same place and in the same form to the end of the animal's life does not hold good.

II.—THE CHANGES IN THE NUCLEI OF THE FIBRES OF THE LENS.

It is known that the nuclei of the fibres of the lens develop from the nuclei of the capsular epithelium, increase in length, and finally disappear gradually. The details of the process have not been accurately followed.

The nuclei of the epithelial cells are originally round. Behind the equator of the lens the nuclei assume an oblique position and the cells develop into fibres. The nuclei

increase in length as the cells extend out into fibres, and the elliptical nuclei may become ten times as long as their original diameter.

In most fishes, and in the frogs, toads, and reptiles, the nuclei are elliptical in the larvæ; in the eels, the salamanders, and herrings they are round.

As new layers of fibres are added to the lens the nuclei gradually disappear. Henle said that the nuclei seemed to atrophy from the periphery; Becker spoke of a granular degeneration. In fact, after the nuclei have reached their maximum size they begin to diminish, first in width and later in breadth, and gradually grow smaller (Fig. 6). Granular changes that have been described in the nuclei are artefacts due to the hardening fluid.

The best means of rendering the nucleus visible without materially changing its structure is to treat the specimens with dilute mineral acids.

Explanation of the Figures.

Fig. 1 is magnified 480 times, the other figures 350.

Fig. 1. Fibres of the middle of the lens in the grown frog.

Fig. 2. Fibres of the middle of the lens in the larva of the frog.

Fig. 3. Fibres of the young eel 1.5 *mm* from the middle of the lens.

Fig. 4. Fibres of the grown eel 1.5 *mm* from the middle of the lens.

Fig. 5. Nuclei of the larva of the salmon: (a) capsular epithelium, (b) outer fibres, (c) largest nuclei, (d) and (e) nuclei diminishing in size.

Fig. 6. Nuclei of the grown eel: (a) capsular epithelium, (b) large nuclei, (c) and (d) diminishing nuclei.

BINOCULAR VISION AFTER EXTRACTION OF SENILE CATARACT OF ONE EYE.

By Dr. EDGAR S. THOMSON, New York.

Mrs. S., aged sixty-three, widow, consulted me May 20, 1899, for a failure of vision in the right eye which she thought had come on in four weeks.

The following tests were made:

R. V. = $\frac{6}{200}$: not improved with glasses.
L. V. = $\frac{20}{40}$ − : $\frac{20}{40}$ w + 1.50 D. S.
Javal, ophthalmometer, 0.50 D. with the rule, in each eye.

By the ophthalmoscope a senile cataract was found in the right eye, almost mature, with only a small amount of clear lens substance anteriorly. The tension was normal, field good, projection accurate.

The left eye showed numerous marginal opacities of the lens with several striæ running entirely to the centre in the lines of the junction of the lens sectors. Fundus normal.

June 3d.—A simple extraction was done under cocaine; the operation was smooth. The reaction very slight, and the only deviation from the usual course of healing was a somewhat tardy closure of the wound which did not unite until the fourth day. There was a slight attack of iritis and a small anterior synechia formed on the nasal end of the wound, hardly enough, however, to distort the pupil. The dressings were removed on the eleventh day.

June 23d.—The tests were as follows:

Javal, R. 7 D., ax. 130° or 40°.
R. V. = $\frac{20}{100}$ w + 8 D. S. ⊃ + 4 D. C., ax. 130°.

June 28th.—The vision had increased to $\frac{20}{40}$ −, and binocular

vision was obtained with the distance correction on each eye. One month later the final tests were made with the following results:

Javal, R. 1 D., ax. 140°.

R. V. = $\frac{11}{10}$ + w + 10 D. S. ⊂ + 1.50 D. C., ax. 140°.

Jäger 1 at 10 in. w + 13 D. S. ⊂ above cylinder.

These were prescribed for her, together with the correction for the left eye, which was + 1 D. S. for distance, and + 2.50 D. S. for near (10 in.).

With these she has binocular vision both for the distance and for the near. She says that the image in the right eye is only very slightly larger than that in the left, and she responds readily to each test for binocular vision, and wears the glasses with comfort.

Knapp (*System of Eye Disease*, Norris and Oliver, iii.), in discussing the advisability of operating on one eye when the other still sees well, says that stereoscopic vision is restored in a certain number of cases.

It seems probable to the writer that more of such cases would be observed than now are met with, if an attempt were made in every case to fit the aphakial eye.

BUPHTHALMUS WITH LENTICONUS POSTERIOR.

By Dr. ED. PERGENS, Brussels.

(from the institut ophtalmique du brabant.)

Translated by Dr. Ward A. Holden.

(*With four figures on Plate I., Vol. XXXV., Germ. Ed.*)

THE case here reported is the first in which lenticonus posterior in man has been examined microscopically.

Karl B., æt. four and a half years, was brought to the institute on account of prominence and inflammation of the left eye. The eye is distended so that it presents the picture of buphthalmus with pronounced keratoglobus. The tension is increased to T + 2. The lids can be closed over the ball. The conjunctiva is reddened but there is no chemosis. The cornea is clear with the exception of a spot in the lower outer quadrant, 3 or 4 *mm* square, where paracentesis had been made at another clinic.

The iris reacts neither to light nor in convergence. The pupil is small, and pyramidal cataract prevents a view of the deeper parts. When the head is thrown back there is a partial trembling of the iris. There is no perception of light. On account of the violent circumorbital pain the ball was enucleated.

The right eye is entirely normal.

When the child was three years old the parents noticed "that the left eye grew faster than the right"; later an oculist was consulted who within three years performed paracentesis of the cornea six times. Whether the corneal opacity followed the operations or whether a spot already opaque was chosen for the puncture the parents are unable to say. An iridectomy was never proposed.

The ball was cut in half and hardened in chromic acid, after

which one half was preserved in glycerine jelly and the other was cut in sections.

The ball was 31.6 *mm* in antero-posterior diameter, 28.5 *mm* in vertical diameter, and 25.5 *mm* in lateral, although it was punctured in the course of the enucleation. The anterior chamber was 7 *mm* deep.

From limbus the insertion of superior rectus was distant 11. *mm*
" " " inferior " " 9.2 *mm*
" " " internal " " 8. *mm*
" " " external " " 9.5 *mm*
" " " superior oblique " 18.3 *mm*
" " " inferior " " 26. *mm*

Fig. 1 shows one half of the ball, natural size. At A, the cornea received a small punctured wound through which the iris at once prolapsed, and therefore this part will not be taken into consideration in my description.

One is at once struck by the peculiar form of the lens. Anteriorly there is a pyramidal cataract, about which are spots of pigment from the posterior surface of the iris, indicative of previous extensive posterior synechiæ. The entire posterior part of the lens is of conical form. This part also is cloudy with the exception of a portion C nearer the centre, which is of normal appearance. The optic nerve exhibits a glaucomatous excavation.

In sections, one sees that the cornea in the middle portion is 0.55 *mm* thick. The projection was chiefly due to stretching of the sclero-corneal junction, as is shown in Fig. 2. The corneal epithelium (Fig. 3) consists, on the surface, of a layer of flattened cells (cut) forming a cuticular membrane, and beneath this of normal cells. The membrane of Bowman is normal at some points, thinned at others (Fig. 3), and here and there destroyed.

The substantia propria of the cornea is normal, as is also the membrane of Descemet and its endothelial layer. Schlemm's canal seems to have disappeared at some points.

The anterior ciliary veins and the vasa vorticosa are dilated and congested, but there is no proliferation of endothelium. The thinned portion of the sclera shows no particular changes. The angle of the anterior chamber is not obliterated but is freely open. The iris is more or less completely detached from the ciliary body, but in many places it is still retained by fibres of the ligamentum pectinatum and masses of exudation. The entire iris is displaced forward, giving one the impression that previously there had been

an adhesion of the angle of the chamber and with the stretching of the sclero-corneal junction a tearing loose of the iris from its attachment so that the angle of the chamber again became free. The iris now appears to have sprung from the cornea. The crypts of the iris are enlarged, the sphincter is not atrophic.

The ciliary muscle is well developed, but the ciliary processes are elongated in various directions. The choroid is thinned and its vessels are small although no degeneration of the vessel walls is apparent.

The zonula fibres are increased in number and in length as though, having a heavier lens to carry, they had grown stronger. The lens including the pyramidal cataract is 7.6 *mm* in antero-posterior diameter and 9 *mm* in transverse. The pyramidal cataract is 3 *mm* broad at its base, and about 0.75 *mm* high. It is quite possible that this pyramidal cataract was produced by a further growth of the lens through the pupil while the circular synechia restricted its lateral extension, as evidenced by a depression about the cataract. The capsule of the lens is normal anteriorly, but it is very thin posteriorly, particularly to the nasal side where there was probably a rupture. The capsule is normal over the pyramidal cataract, and the substance of the latter is a direct continuation of the anterior epithelium. Some fibres in the periphery of the lens are normal, and there is a normal area at p. norm. Fig. 4, but the remainder of the lens is made up of vacuoles, Morgagnian globules, detritus, and other granular masses.

The retina exhibits some changes in the rods and cones. The optic disc is excavated and the nerve fibres have mostly disappeared and been replaced with new connective tissue. No trace of a hyaloid artery was to be found.

Since the right eye was entirely normal, the left eye only being affected, the cause of the disease must be sought for in the local conditions of the eye. I believe that the lenticonus may be considered the cause of the buphthalmus. The lenticonus may have been congenital, but the pyramidal cataract appears to have enlarged after the synechiæ formed.

The size and weight of this lens would cause this case of buphthalmus to be put into that category of glaucoma cases which Priestley Smith believes to be due to a large lens.

The reason that other cases of lenticonus have not been complicated with glaucoma, is perhaps the small size of the conus which skiascopic examination in most cases has shown to be a

spherical projection; the rabbit's lens examined by Becker also had a spherical projection. The pig's eye and the rabbit's eye examined by Hess had very large lenses, but little is said about the rest of the eyeball, though, so far as can be learned, the chamber angle seemed to be normal and the ciliary body and iris healthy.

The rational therapy would have been to extract the lens with iridectomy as soon as the ball began to enlarge.

Pathological examinations have been made of three animals' eyes with lenticonus.

Otto Becker[1] received from Uhthoff a specimen from a rabbit which had lenticonus in each eye. Posteriorly there was a process 1.5 *mm* high, somewhat constricted at the base, and covered in greater part or completely with normal capsule. Probably the entire mass was transparent. Hess[2] examined a pig's lens with lenticonus. The anterior portion of the lens was normal, the posterior portion conical. There was posterior polar cataract. The capsule was thinned, but whether ruptured or not could not be made out with certainty.

Hess's rabbit's lens was obtained from an otherwise normal animal two months old. There was a conical process at the posterior pole of the lens. The fibres were almost all displaced. Normal lens tissue alternated with Morgagnian globules and detritus. Posteriorly the capsule was very thin and Hess thought that previously there had been a break there. There was no nucleus in the lens. Posteriorly there was a slight opacity.

In the second eye of this rabbit the lens had a nucleus, and there was posterior polar opacity but no lenticonus.

In man the following cases have been diagnosed clinically:

1. F. Meyer, 1888. A case of lenticonus posterior. *Centralbl. f. prakt. Augenheilk.*, xii., p. 41. A boy of ten had a lenticonus in the right eye which diverged slightly. With this eye he counted fingers at 3.5 *m* and read Jaeger No. 9 at 5 *cm.* With — 12. D he saw somewhat better. There was a posterior polar cataract. The condition was probably congenital. The left eye was normal.

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[1] *Anatomie der gesunden und kranken Linse*, 1883, p. 125.

[2] *Path. anat. Studien*, 1896. "Histologische Studien über Lenticonus posterior." *Graefe's Archiv*, xlii., 3, p. 234.

2. R. W. DOYNE, 1889. A peculiar form of lens degeneration. *Trans. Ophth. Soc. Un. K.*, ix., p. 113. A woman of seventy had seen poorly for several years. A diagnosis of lenticonus was made. The periphery of the lens had a myopia of −3. D and the centre of −14. D. With − 14. D, V = $\frac{6}{36}$.

3. HARTRIDGE, 1889. *Trans. Ophth. Soc. Un. K.*, ix., p. 115. The patient was a girl of seventeen with congenital lenticonus in both eyes. The refraction was 5. D higher in the middle of the lens than in the periphery.

4. KNAPP, 1889. A case of lenticonus posterior. ARCH. OF OPHTHAL., xviii., p. 451. *Arch. f. Augenheilk.*, xxii., p. 28. A girl of eight had in the right eye lenticonus posterior without opacities. She counted fingers at twelve feet. There was moderate divergent strabismus. With − $\frac{1}{12}$, V = $\frac{20}{200}$. Left eye normal.

5. KNAGGS, 1891. On lenticonus. *Lancet*, vol. (?). A woman of fifty-six had had good vision until six months before. R with −10.−1. c, V = $\frac{6}{12}$; L with − 11, V = $\frac{6}{18}$. Jaeger No. 8 at 4.5 inches without glasses. Both eyes had lenticonus posterior with posterior polar cataract. The patient had been deaf since her twenty-seventh year and suffered from oxaluria. The lenticonus was not congenital.

6. WEEKS, 1891. A case of lenticonus posterior, with remarks. ARCH. OF OPHTH., xx., p. 260. A girl of eight had strabismus of the left eye. This eye had lenticonus posterior. V = $\frac{1}{200}$, and glasses gave no improvement. In the periphery of the lens there was hyperopia of 3. D, and in the centre myopia of 12. D. The right eye was normal except for two thin filaments on the iris, remains of the pupillary membrane. R V = $\frac{20}{20}$, emmetropia. The condition in the left eye was congenital. There was posterior polar cataract, and remains of fœtal arteries could be seen.

7. EISECK, 1892. A case of lenticonus posterior. *Klin. Monatsbl. f. Augenheilk.*, xxx., p. 116. A woman of thirty-six had vision L $\frac{5}{200}$, R $\frac{1}{100}$, not improved with glasses. The right eye had hard poor vision from the patient's youth. There was lenticonus with posterior polar cataract.

8. GULLSTRAND, 1892. A case of lenticonus posterior. *Nord. Ophth. Tidszkr.*, v., p. 18. A man of thirty had normal vision in the right eye. He had noticed in his twelfth or thirteenth year that the sight of the left eye was poor without recognizing any cause for it. There was slight divergent strabismus, V = $\frac{1}{100}$. The refraction was stated to be emmetropic,

although there were lenticonus posterior and posterior polar cataract.

9. MITVALSKY, 1892. A new case of lenticonus posterior with partial persistence of the hyaloid artery. *Centralbl. f. prakt. Augenheilk.*, xvi., p. 65. A girl of eight had normal vision in the right eye with + 2. D. The left eye could count fingers at 1 metre. There was lenticonus posterior, with a slight posterior polar cataract and a white opacity in the upper-inner quadrant of the lens capsule. In the centre of the lens there was myopia of 20. D, in the periphery hyperopia of 4. D. Attached to the posterior capsule of the lens was a filament 2 *mm* long, which extended back into the vitreous and was considered to be the remains of the hyaloid artery. The malformation, therefore, was probably congenital.

10. L. MÜLLER, 1894. Does lenticonus consist in an anomaly of the posterior surface of the lens? *Klin. Monatsbl.*, xxxii., p. 178. The first case was in a boy of eighteen with normal vision and hyperopia of 1. D in his left eye. In the right eye the fundus could be seen through the centre of the lens without any correction, and through the periphery of the lens with — 2.5 D. V = $\frac{6}{3\,6}$, and Sn. 2.25 at 25 *cm.* The lens has no polar cataract, but the anterior surface was more curved than normal, though not sufficiently to change the weak refraction of the central portion of the lens to the myopic. Müller thinks that the designation "lenticonus" should not be applied in cases in which no anatomical examination is made, but he would describe the condition as "a lens with double focus."

11. MÜLLER—SALZMANN, *ibid.*, p 184. A girl of ten had R with + 1.25 + 2. c v, V = $\frac{6}{6}$?; L with 9. D $\frac{6}{3\,6}$. Downward and outward there was a T-shaped opacity of the lens. The periphery has a refraction of — 4. D, the central part of — 13. D.

12. ELSCHNIG, 1895. Lenticonus posterior. *Klin. Monatsbl.*, xxxiii., p. 239. A girl of seventeen was emmetropic in the left eye, in the right there was lenticonus posterior, with posterior polar cataract, and some scattered patches of opacity. Through the periphery of the lens the refraction was + 4. D with some astigmatism, in the centre it was — 30. D. This eye could count fingers at a short distance with uncertain fixation.

13. LANG, 1895. Lenticonus posterior. *Trans. Ophth. Soc. Un. K.* (Original not obtainable.)

14. SYM, 1895. A case of lenticonus posterior. *Ophth. Review*,

xxiv., p. 76. A woman of fifty-two had R with − 9. D, V = $\frac{8}{10}$; L with − 15. D, fingers counted at *2 m.* In the left eye besides the lenticonus, there were changes in the choroid but no opacities and no signs of a hyaloid artery.

15. CRAMER, 1896. A case of lenticonus posterior. *Klin. Monatsbl.*, xxxiv., p. 278. A girl of nine had in one eye with + 2. c v, V = $\frac{8}{10}$. The other eye could count fingers at 16 feet. In the latter were found corneal astigmatism and lenticonus posterior, but without opacities of the lens. No strabismus. The refraction at the margin of the lens was + 3. D, through the centre − 11. D.

Müller states, in his paper on this subject, that one cannot say with certainty whether there is merely a difference in the refraction of the nucleus of the lens, or an actual lenticonus. In his case the nucleus appeared to be absent, or partially absorbed, hence the normal refraction of the central part.

Demicheri[1] also accepted this explanation to account for the myopia in beginning cataract, from the increased refractive index of the lens, the nucleus often being more affected than the cortex, so that the condition resembles that seen in lenticonus. These cases come into Müller's category of lenses with double focus, which seems to me a fitting name.

Besides the refraction, another characteristic of false and true lenticonus posterior is the condition of the Purkinje figures. That of the posterior surface of the lens, as soon as it reaches the margin of the conus, doubles, elongates, or disappears. Also, one notices kaleidoscopic appearances in the fundus. A fourth point which may be mentioned is the presence of a dark ring seen about the conus in retinoscopy.

Explanation of the Figures on Plate I.

FIG. 1.—Section of eyeball. *A*, the point where the ball was punctured in the course of the operation. *B*, the lens with anterior pyramidal cataract and lenticonus posterior. *C*, transparent portion of the lens.

[1] "Faux lenticone," 1895., *Ann. d'ocul.*, cxliii., p. 93.

FIG. 2.—Meridional section. *Corn.*, cornea. *C. scl.*, distended sclero-corneal junction. *C. cil.*, ciliary body. *Proc. cil.*, elongated ciliary processes. *Zon.*, zonula fibres. *L.*, lens. *Exs.*, exudation at the ruptured base of the iris. *Ir.*, iris. *Scler.*, sclera.

FIG. 3.—Corneal epithelium. Zeiss F. oc. 2. *Cut.*, cuticular layer. *Ep.*, epithelium. *l. B.*, Bowman's membrane.

FIG. 4.—Section of the lens. *Syn. p.*, posterior synechiæ, now broken up; *p. norm.*, normal portion of lens; *vac.*, vacuoles; *M. K.*, Morgagnian globules.

ABSTRACTS OF THE PAPERS IN VOL. XXXIV. (1897) OF THE GERMAN EDITION OF THESE ARCHIVES NOT PREVIOUSLY TRANSLATED.

By Dr. WARD A. HOLDEN.

VI.—Bacteriological Investigations on the Influence of Antiseptic Dressings on the Bacteria in the Conjunctival Sac and on the Margin of the Lid.

By Dr. **L. BACH,**

PRIVAT-DOCENT AND FIRST ASSISTANT TO THE UNIVERSITY EYE CLINIC AT WÜRZBURG.

THE present paper forms a continuation of the author's previous studies, and its purpose is to make clear the question as to the possibility of sterilizing the conjunctival sac and margin of the lid.

The use of moist applications of antiseptics is very general, and it is therefore of interest to determine by a great number of experiments whether such therapeutic measures are of any efficacy from a bacteriological point of view.

In order to have quantities of bacteria present I inoculated the conjunctival sac and lid margin with a harmless bacterium. Then a platinum loop was passed several times over the lower cul-de-sac, and agar plates were inoculated. The loop was then rubbed along the margins of both lids and other plates were inoculated. After this a pledget of cotton was dipped in bichloride solution 1:3000 or 1:1000, or into hydrarg. oxycyanat. 1:1000, and after being squeezed nearly dry was applied to the closed lids. The pledgets

were changed every forty-five minutes for seven or eight hours and then the inoculation on agar plates repeated.

As a control test a number of patients were inoculated in the same way, but no therapy of any sort was undertaken.

Tabular results of the experiments are given. In general it appeared that in almost all cases the quantity of bacteria in the conjunctival sac diminished. This, however, the author attributes to the effect produced by winking the lids.

The bacteria on the lid margin were also reduced in many cases, and here the result seemed to be due to the use of the antiseptic, although it did not matter which antiseptic was used.

Thus it is seen that sterility of the conjunctiva and lid margin is not to be obtained by using antiseptics, but rather by mechanical cleansing.

X.—On Hutchinson's Affection of the Fundus (Retinitis Circinata, Fuchs).

By Prof. **GOLDZIEHER**, Budapest.

In the *Wiener med. Wochenschr.*, 1887, No. 26, I described a peculiar form of retinal disease, then practically unknown, which I had observed in three patients. The nearest description that I could find in literature was that of J. Hutchinson in vol. xiii. of the *Ophthalmic Hospital Reports*, under the title, "Symmetrical Central Choroido-retinal Disease Occurring in Senile Persons." He says that old people are those chiefly affected, that they are otherwise healthy, and that women are more frequently affected than men. They all have reduced central vision. The disc and the retinal vessels are normal. There are changes in the middle of the retina consisting of yellowish-white lustrous spots which become confluent and form large plaques with irregular margins. The spots are not surrounded with pigment, and the only pigment found is due to retinal hemorrhages, which are usually present near the macula. The periphery of the retina is healthy.

My paper seemed to have been almost entirely overlooked when Fuchs published his paper on "Retinitis Circinata,"

in which he described exactly my "Hutchinson's Affection of the Fundus."

Further clinical histories follow of this affection which is now fairly familiar. A long discussion as to the probable pathology may be omitted, since Ammann (these ARCHIVES, xxvii., 2) has found that the retinal changes are such as result from hemorrhage.

XII.—On the Pathological Anatomy of Spontaneous Luxation of the Lens into the Anterior Chamber.

By Dr. **K. RUMSCHEWITSCH**, Kieff.

The author gives a detailed clinical and anatomical description of two eyes that were enucleated for glaucoma after luxation of the lens into the anterior chamber. He ends the paper as follows:

The results obtained in the examination of the two cases do not permit any general conclusions to be drawn, nor do they explain the mode of origin of the luxation, since the two cases were of quite different character; and I shall only call attention to two circumstances. In the first place, the results show conclusively that the zonula stands in no relation to the hyaloid membrane. In all the descriptions of luxated lenses, no traces of zonula fibres have been found on the capsule of the lens. The anterior attachment of the zonula is always torn, never the posterior.

The condition of the zonula is a factor to which considerable attention must be given in cases of luxation of the lens. Although anatomical observations in this regard have been very few, it must always be repeated that the cause of spontaneous luxation lies in the maceration or in the atrophy of the zonula. In my first case, the zonula was very well preserved, and its fibres were fully developed, so that there could be no possibility of maceration, and yet there was luxation. The only probable explanation is that there was so great an extension of the anterior segment of the ball that the elasticity of the zonula was overcome. In the second case there was no such extension, but the spaces between the various tissues of the eye were enlarged and filled

with an albuminous liquid. Under these circumstances the zonula fibres might easily have suffered maceration. The changes found in the fibres, in fact, indicate such maceration. This case, therefore, supports the supposition already expressed as to the changes in the zonula which permit luxation.

XIII.—The Diminution in the Refraction of the Eye Caused by the Removal of the Lens.

By Dr. **MAXIMILIAN SALZMANN**, Privat-docent, Vienna.

This is a mathematical paper which does not lend itself to condensation.

XVIII.—A Clinical and Pathological Contribution to the Subject of Tuberculosis of the Lachrymal Gland.

By Dr. **JACOB SÜSSKIND**, Stuttgart.
(from the university eye clinic, würzburg.)

Although tuberculosis shows a special preference for glandular organs, the tuberculous affections of the lachrymal gland are exceedingly rare. Four years ago the first case of this sort was described by De Lapersonne, who called general attention to this affection after discovering by microscopic examination that a tumor supposed to be a sarcoma of the orbit was in reality a tuberculous lachrymal gland. About the same time, L. Müller described two cases of primary tuberculosis of the gland, in which he succeeded in finding the bacillus. Later Baas reported two cases and Salzer one.

The history of our case is as follows: A servant girl, aged twenty-one, had noticed for two years and a half the development of a growth in the region of the left upper lid, which recently has been stationary. Otherwise the patient is healthy.

June 25, 1895, the region of the left upper lid projects forward in its entire lateral extent, and from the tarsus to the brow. In the middle portion of the swelling is a red spot where dilated blood-vessels in the skin and subcutaneous cellular tissue show through. The palpebral fissure is only 5 *mm* wide in the middle in this eye, while it is 9 *mm* wide in the other. On palpation the

tumor feels quite soft, but from it a denser mass extends back into the orbit. The movements of the eye are normal, and the ball is intact. A great number of the cervical and inguinal glands are slightly enlarged. The preauricular are considerably swollen.

June 28th, the tumor and the preauricular glands were removed by operation. An incision was made through the entire length of the upper lid, midway between the brow and the lid margin, and the neoplasm with its pedicle extending deep into the orbit was dissected out entire. The neoplasm was of kidney shape, 3 *cm* long and 1 *cm* broad at its broadest point. The surface was fairly smooth with a few constrictions, and of moderate hardness. The preauricular glands were removed entire and presented the same characteristics.

Sections stained with hematoxylin revealed chiefly at the margin well preserved glandular tissue—transverse sections of gland ducts with normal epithelium, and longitudinal sections of ducts and acini. Evidently these structures belonged to the lachrymal gland, but they were confined to a small area. Where the disease begins first, the interacinous connective tissue is more or less infiltrated with round cells ; these soon become so numerous that they push the remaining glandular elements far apart. The round cells also wander into the glandular structures and pass between the epithelial cells and into the ducts. Gradually they occupy the entire space and the glandular tissue has disappeared. In general, the round cells were present in such numbers and so regularly distributed that the picture of sarcoma was suggested, but here and there were typical submiliary tubercules. Some of these were exclusively epithelioid while in others round cells were present in such number that the tubercles presented a lymphoid structure. Many giant cells were present, and in these were found tubercle bacilli in considerable number.

The preauricular glands showed the same tuberculous character. One portion of the tissue removed appeared to have belonged to the parotid gland, the disease having extended to this through the lymphatics.

We may say as to the clinical picture of tuberculosis of the lachrymal gland, that there appears a dense tumor sometimes as hard as cartilage, about the size of an almond, freely movable and not adherent to the overlying skin, lying in the temporal portion of the upper part of the orbit. Usually

the limits of the tumor posteriorly cannot be determined. In three cases its development has been rapid, *i. e.*, within 2–3 months, in three it has required 3–4 years. In only one case was there pain at the beginning. The tumor is not sensitive to pressure. The overlying skin was red and swollen in three cases.

In five cases there was tuberculosis elsewhere, or at least suspicion of tuberculosis, and in only one was there not even an hereditary disposition. Excepting slight disturbances of mobility the eyeball has been normal. Microscopically there have been found the typical changes of miliary and submiliary tubercles with more or less round-celled infiltration. Actual caseation was not found, but the vitality of the cells composing the centre of the tubercles was often low.

XIX.—A Case of Bilateral and Non-Inflammatory Glaucoma in Early Life Associated with Retinitis Pigmentosa and Myopia.

By Dr. **HEINERSDORFF**, Elberfeld.
(from the University Eye Clinic at Berne.)

In these Archives, vol. xxvii., p. 53, German edition, Bellarminoff described a case of retinitis pigmentosa complicated with glaucoma. I have been able to find but four other cases recorded, and on account of their rarity I present the following case:

R. M., aged twenty-two, has since early youth suffered with night blindness and poor vision in the distance. Lately he has noticed that his vision is growing poorer and that his visual fields are smaller. In the last four or five months there has been a cloud before his eyes which has hindered him at his work—that of a clerk.

Three years before, the patient had been examined in our clinic, when a considerable concentric contraction of the visual fields had been found and a diagnosis of retinitis pigmentosa made.

April 17, 1895, the patient appeared healthy, although there were traces of albumen in the urine and a few hyaline casts. Myopia 6 D in each eye, anterior chambers shallow, media clear,

T + 2 in both eyes, R V = 0.45 with − 6 D, L V = movements of the hand excentrically. R, great concentric contraction of the field. Ophthalmoscopically, both discs grayish-white and excavated up to the margin. The vessels are few and very narrow, and can be followed only a short distance from the disc. The middle zone of the fundus exhibits the typical pigmentation of retinitis pigmentosa. [The colored plate in the German edition, though pretty, is omitted, as it shows nothing new ; also the cases are not so very rare. H. K.]

Eserine one per cent. was tried without result. An anterior sclerotomy was made in the right eye. The tension rose again after this, but was controlled by one per cent. pilocarpine in vaseline, which acted much better than the simple solution. The vision in the right eye was a little less after the operation than before, but a year later no further disease had occurred. A posterior sclerotomy was done in the left eye.

XXI.—Purulent Keratitis in Man. A Bacteriological and Clinical Study.

By Drs. **L. BACH** and **R. NEUMANN**, Würzburg.

This paper contains the results of the examination of thirty-two cases of corneal ulcer. The results agree with those of Gasparrini, published in 1893, and those of Uhthoff and Axenfeld, published later, as to the fact that serpent ulcer of the cornea is usually due to the pneumococcus.

REPORT ON THE PROCEEDINGS OF THE SECTION OF OPHTHALMOLOGY AT THE ANNUAL MEETING OF THE BRITISH MEDICAL ASSOCIATION, AT PORTSMOUTH, AUGUST, 1899.

By W. J. Lister, Esq.

AUGUST 2D., THE PRESIDENT OF THE SECTION, **SIMEON SNELL**, F.R.C.S. ED., PROFESSOR OF OPHTHALMOLOGY, UNIVERSITY COLLEGE, SHEFFIELD, IN THE CHAIR.

On the Prevention of Eye Accidents Occasioned by Some Trades.

Of the opening address by the President, the MS. of which was kindly put at our disposal, we give an elaborate abstract on account of its high practical value.

After a few introductory remarks Mr. Snell said:

I desire to ask your kind attention for a short time to some remarks on the causation and prevention of eye accidents in certain trades. Practically my whole professional life has been spent in a very populous district, well known for its extensive iron and steel works, for its cutlery, and for a number of metal and other trades, and also as the centre of a very extensive coal-field.

Magnus in his tables gives 8.5 per cent. of all cases of blindness as due to accident. Those blind in one eye only and the far larger number who have sustained permanent injury in varying degrees short of blindness are excluded in such a calculation, and, however true such a statement may be for the community generally, it must be largely exceeded in large and populous centres, especially those in which iron and steel are important industries.

Mr. Watson, the able secretary of the Miners' Permanent Benefit Fund has given me the following statistics as to the proportionate frequency of eye accidents among miners to other accidents.

Period.	No. of accidents.	No. to eye.	Percentages.
1884 to 1888	16,870	857	5.08
1889 to 1893	12,768	670	5.24
1894 to 1898	18,624	979	5.25
Total . . .	48,262	2506	5.19

The average yearly membership, for each period, was, 1884 to 1888, 22,410; 1889 to 1893, 17,876; and 1894 to 1898, 23,005.

In all these accidents the miners have been rendered unfit for continuing their work, at least temporarily. The figures are for fifteen years arranged in periods of five years. It is curious to see the proportion 5 per cent. coming out practically the same for each period. The number of non-fatal accidents dealt with is 48,262.

The Equalized Druids' Society, embracing all classes of workmen, gives to its members who are permanently incapacitated from following their employment a grant of £100. The number of cases of all accidents in which this grant has been made during the last five years is fifty-seven, and out of that number the recipient has obtained it seven times owing to eye accidents.

Of the last 2546 patients who have passed through my wards (ophthalmic) at the Sheffield Royal Infirmary 2038 were men, and 516 women. Of the 2038 men, 622 were admitted for accident, or 30.4 per cent. Of the 516 women, only 36 were admitted for accident, or 6.9 per cent.

In many trades associated with iron and steel in all its varieties, small foreign bodies are very prone to become lodged in the workmen's cornea. I take as an example the grinders. In the course of the day a grinder may get several foreign bodies fixed in his cornea, or days may elapse without such a mishap. "Mote" is the name popularly given by the workmen to these particles in their eyes. If the cornea of a grinder be carefully examined with a magnifying glass it will not infrequently found to be studded over with minute nebulæ. Though, therefore, the damage done by each "mote" may often not be serious, yet the frequent repetition, by dulling the cornea, will, in many cases, diminish the acuteness of vision. These particles may either be small fragments of stone, or, much more frequently, small portions of steel,

or emery, which last is largely used as a wheel for glazing cutlery, and for other purposes.

A few observations about the grinders' work will be of interest. I take works where, at the time of my visit, besides outworkers, seven hundred men were engaged in making pocket-knives, razors, etc. Of the two varieties of grinding, it was at once evident that the dry-grinders were more exposed to injury from foreign bodies than the wet-grinders. A grinder sits across his bench, which he calls his "horse," and presses the knife or razor blade on the stone. The wet prevents the particles flying about a good deal, but a man's face becomes, as he works, bespattered; nevertheless a wet-grinder would say that, compared with the dry-grinder, he seldom gets motes in his eye. In dry-grinding the sparks fly freely, and it is evident that particles, very minute, of steel or stone, are being projected about, and it is the merest chance whether they hit the man's eye or face, or scatter about the room. There can be no question that the grinder derives considerable immunity from these "motes" by the employment of protective glasses. Several grinders whose ocular condition necessitated the wearing of spectacles have admitted the protection they afforded. If further testimony were needed, it can be found in the condition of the glasses after use for some time by a grinder. This suggests the proper correction of errors of refraction by spectacles.[1]

It must be admitted that in the great majority of instances the damage occasioned to the grinder or other operative to whom such mishaps occur is not attended with serious results. To many, however, the immediate injury is serious, either *directly* or by the *ulceration* that ensues.

In the various trades in which steel and iron are used, the operatives are liable, though to a less degree than the grinder, to get these motes into their eyes. Many workmen are skilful in removing motes from their comrades' eyes. In all the large works there are men who have a reputation in this way. It is, besides, not an infrequent sight even in the streets to see a man with his head against a wall and a fellow-workman endeavoring to remove a foreign body from his eye. The number of foreign bodies

[1] After a time, in grinding blades, a stone gets blunted, its pores becoming filled up with portions of hard steel. A process is then adopted for "cleaning" or "sharpening" the stone, and it is more than usually dangerous, because it liberates these particles as well as makes fresh ones.

some of these men remove in the course of a day is very large. One man, a timekeeper at works where one thousand men, besides outworkers, were employed, told me he had for fifteen years at least been recognized as a skilful remover of motes. Sometimes he has extracted a score or more a day ; sometimes the number was much less, but he had not for many years passed a day without at least one case. He was not the only man with a reputation at these works, for grinders and others also removed motes. He used a lancet with the end blunted. It was quite clean, and he kept it so by either putting it on a strop or wet stone. For the same purpose other men would use a lancet, pocket-knife blade, or even a pin, etc. The knife would, very possibly, be the same used at the man's lunch, and the pin, not infrequently, is put into the mouth to wet it before being used, and is very likely kept stuck in the man's waistcoat, where it comes in contact with the dirt collected in the clothing.

Without doubt in many instances these motes are skilfully removed, in others there is a good deal of bungling. The instruments generally used are unsuitable. Not infrequently cases come under observation in which sloughing corneal ulcers have resulted from the efforts made to remove a mote. It seemed to me not unlikely that a septic condition was set up in consequence of the uncleanly instruments which were so often employed. Dr. Shennan, of Edinburgh, kindly undertook a bacteriological examination of some of these instruments for me. I collected twenty-two tools used by different men ; seventeen of these were got together for me by the skilful timekeeper I have already mentioned, the other five were obtained at large engine works. Some of the tools were fairly clean, but others were in a dirty state ; two or three were magnetic. Dr. Shennan examined the majority of these tools. Taking all in all, he found nothing pathogenic excepting the staphylococcus pyogenes albus, whose virulence is comparatively slight. The other organisms found were chiefly sarcinæ of the more common varieties, and bacilli of the "subtilis" (Hay bacillus) group. He failed to obtain cultures from one only of the instruments, and the greatest number of separate colonies were obtained from a common white pin. The presence of organisms had apparently no special relation to the cleanness or rustiness of the tools. They were present on the brightest steel, whereas the instrument from which he failed to obtain cultures was a lancet, the blade of which was slightly but decidedly

rusty. Still, as he remarks, one cannot lay much stress on such an occurrence, as it might be accidental.

By far the most serious eye accidents happen to men engaged in working iron or steel. The following figures exhibit this in a very lucid light. Out of this total of 359 eye accidents to males, taken from the records for this purpose consecutively, which were so serious as to require admission to my wards at the Sheffield Royal Infirmary, no fewer than 173 were caused by iron or steel. There were also 43 due to burns from molten metal, sparks, flashes, etc.

The opportunity for the infliction of severe injuries to iron and steel workers is multitudinous. They occur in all branches of the trade, in the lighter iron and steel industries, as well as in the heavy trades where armor plates are made and heavy castings of scores of tons. A very large proportion of the accidents are occasioned by what is called "chipping" and "fettling." Dressing is the name given in some parts to this process. This work consists in chipping the rough edges from steel and iron castings, ingots, and all kinds of iron and steel work and, among other things, even the large armor plates. Whatever be the special kind of metal or steel to be fettled, the manner in which it is done is practically the same. A hammer and chisel or sate are used, and with these the roughnesses are removed. I understand that at works where, say, a thousand men are employed, two hundred or more would be occupied more or less in "chipping." Many men are frequently working close to each other, so that the danger is not only to the worker himself, but to those around. Passers-by are by no means infrequently the victims, and many blinded in this way have come under my notice. The chipper himself is often hit by the rebound of the splinter after it has struck perhaps the narrow angle of steel or iron upon which he may have been working or some other object. It must be recollected, also, that in the process spoken of, the danger is not merely from the iron or steel which is being operated upon, but there are three other places from which splinters may be, and actually are, given off and cause injury, viz., the hammer head, the chisel head, and the chisel point.

The sizes of the splinters spoken of vary from the most minute to others measuring some inches in length and may be thick or thin. The injury inflicted varies, of course, in accordance

with the size of the missile and the force with which it is projected. The small fragments may be thrown off with such velocity that they penetrate the eyeball and become embedded in its interior, in some instances passing through the eyelid before reaching the globe. The destruction to sight in this way is very large. I have, myself, removed from the globe, with the electro-magnet, I believe, more than 200 fragments of steel and iron, mostly projected into the eye in the manner I have just described. I have arranged in a case, for your inspection, 117 of these splinters. Though all are comparatively small, there is a great variety in size. One is no heavier than .0015 grain, the largest weighs 36 grains. This is not the place to refer to the results of the extraction of this number of foreign bodies with the electro-magnet, and I content myself with saying that many eyes have been saved by its employment which otherwise would have been hopelessly lost.

It has been my sad fortune on more than one occasion to have a workman under treatment in consequence of a severe injury caused by a large or small splinter of steel or iron and in which loss of sight has resulted, who has, afterwards, returned to his work and has again come under my care with a similarly disastrous accident to the remaining eye. In one instance, which I well remember, a very few weeks only had elapsed between the two accidents.

Besides the manner of arranging the men to prevent injuries, it is fortunate that the dangers of chipping may be avoided by adopting a pneumatic chipper.

I visited one of the works, where I saw the pneumatic chipper at work on a large casting. It has the advantage of accomplishing in one hour what, by hand, would take six or seven hours. It certainly prevents the flying about of splinters in a remarkable manner. It is more like using a cheese scoop in a fairly soft cheese than running any tool over hard steel.

Another class of severe injuries which are of common occurrence are *burns from molten metal.* Sparks and flashes fly about freely in almost every instance that molten metal is run into the moulds, but in some, of course, more so than in others, and the portions given off vary much in size. Injuries caused in this manner were no fewer than 43 out of the 359 consecutive accidents in males admitted to the Royal Infirmary under my care. In the forgings also, great or small, when the iron or steel is being

hammered either by hand or, in the case of larger castings, by a steam or hydraulic hammer, portions are given off the glowing metal, and those working, and the bystanders, are exposed to danger of burns. Injuries inflicted by molten metal are very serious owing to the immediate destruction of tissues or the later results.

The knowledge which I have acquired from contact with working men that have been injured, and visits from time to time to many of the principal works, has long since satisfied me that much of the destructive injury to sight, which is constantly coming under one's observation, is preventable, and that means can, and should, be adopted to endeavor to lessen the risks to sight which are at present associated with such important industries. My experience has shown me that there is less difficulty in enlisting the support of the employers than the assent of the men to adopt precautionary measures. With the Compensation Act in force, I have no doubt that the assistance of the masters will even be stimulated. It only recently came to my knowledge that one firm had made it compulsory on men engaged in "chipping, fettling, turning," and other work in which iron and steel splinters were liable to fly off and endanger sight, to wear protectors, which were provided at the expense of the firm. This decision was taken in consequence of a workman being blinded by a chipping, and it is easy to see, while creditable to their humanity, how such a course, if it tends to prevent loss of sight, is likely to be a pecuniary saving.

In considering what kind of protectors men should use certain points must be borne in mind. The cost must be moderate, and any covering over the eyes should interfere with sight as little as possible, if at all. Among iron workers glass is practically out of the question. Even thick rock crystal, which has been suggested for some kinds of work, in consequence of its thickness and peculiar manner of fracture, would hardly do. There are a great variety of protectors in the market, but they have been little used. Gauze wire, fitting close to the eye like a cup, and attached to the head by a string, is employed by stone breakers and in some ironworks. They complain of them as being hot and interfering with sight, but there is no question that such protectors afford considerable immunity from accident. Another practical point about protectors is that they should not be liable to rust. For this reason galvanized iron wire or, better, aluminium wire is of ser-

vice. The mesh should be strong and fine and sufficiently close to prevent, as far as possible, even small chippings passing through it, and yet to interfere with sight as little as need be. I have supplied workmen with such protectors, who have used them for chipping, steel melting, and other dangerous iron and steel work. I learn that they answer their purpose well as protectors, and that the interference with sight is very little, not greater than that occasioned by many ladies' veils.

I would sum up my suggestions as to the means for protection as follows :

1. The grinder will find that large glasses made of plain glass, or indeed his own spectacles, should his refraction require their use, will afford great protection. Or he may use other protectors made with glass in front and gauze surrounding it.

2. The use of protectors should be compulsory for those workers in iron and steel whose employment renders them liable to be injured by splinters or who are exposed to dangers from molten metal.

A gauze eye-shield will, I believe, answer the purpose well. The cost is low, and it is worth the employers' while to supply their men with them. Other means to be adopted are :

(*a*) The use of a pneumatic chipper whenever practicable ; (*b*) the proper arranging of the men at their work ; and (*c*) the use of screens so as to avoid injury to their fellow-workmen and to passers-by.

W. F. Richardson Cross read a paper on **the pathological significance of sympathetic irritation and its connection, if any, with sympathetic ophthalmitis.**

He described the symptoms of the two conditions and the variability of the period after the injury at which they occurred. He enumerated the injuries and the consequent conditions of the exciting eye liable to set up sympathetic irritation and ophthalmitis and noted the uncertainty of foretelling whether an injured eye will set up sympathetic mischief or not.

After discussing the various theories of the pathology, he concluded that though suggestive they still remained unproven. Very little opportunity had so far been obtained of studying the pathology of sympathetic irritation, and at present the old theory that the irritation is due to a reflex neurosis is the one usually held. In some cases the affection would appear to be due to the presence of organisms in the sympathizing eye, which for the

time being are capable of setting up irritation only, but are liable at any time later on to give rise to inflammation.

Apparently irritation leaves a permanent damage to the eye in some instances. Brailey quotes 29 cases where enucleation of the exciting eye was performed to relieve sympathetic irritation: in 16 of the 29 cases the latter was cured, in 13 it was uninfluenced or rendered worse. Mr. Cross asks why, if the irritation be a pure neurosis, were not all the cases cured by removal of the cause?

Irritation may go on for years without the occurrence of inflammation or it may last only a few days before inflammation follows it. He thinks that the temporary irritation which seems to culminate in inflammation appears to be different in its causation from that which occurs independently.

He advises that synechia and cicatricial traction or pressure should be relieved if practicable; but that great efforts should not be made to retain blind and dangerous eyes. An eye that is neither comely nor useful, and which is in any degree a possible source of mischief to its fellow, should be enucleated.

In the discussion which followed, Dr. LANDOLT agreed with Mr. Cross that a lost and dangerous eye should be removed. He had never followed the proposals put forward to save the healthy eye in place of enucleation, such as resection of the optic or ciliary nerves, subconjunctival injections of antiseptics, etc. He had lately seen a case where after penetration of one eye by a foreign body, in spite of subconjunctival injections of sublimate, the injured eye became severely inflamed and gradually shrunk, while the other showed marked signs of sympathetic ophthalmitis, the further development of which was stopped by removal of the exciting eye.

Mr. MACHARDY said he was glad to find such unanimity of opinion as to the advisability of removal of any eye blinded by injury. He was reminded of the advice of Sir William Bowman, that when enucleation in these cases had been recommended it should not be stated as necessary to the salvation of the sight of the fellow eye, since the period which elapses between the injury and the inflammation in the sympathizing eye might be three weeks or forty years, and each year of postponement tends to damage the patient's estimate of the oculist.

Surgeon-General COLEY mentioned a case of sympathetic irritation coming on seventeen years after injury, and which quickly

subsided after removal of the injured eye. He thought that the attack must have been due to neurotic influence and not to direct microbic or other inflammation spreading from the injured eye.

Dr. DE SCHWEINITZ agreed with Mr. Cross and Dr. Landolt in their treatment of dangerous eyes, and maintained that sympathetic irritation and sympathetic ophthalmitis should be regarded as separate diseases, each with its own pathology. He concluded with a plea for a more thorough examination of patients with sympathetic ophthalmitis, an examination of the leucocytes, the range of temperature, etc., and suggested that information thus gained might be a factor in the differential diagnosis.

Dr. REEVE mentioned a case of sympathetic irritation which had lasted for fifteen years, and where complete recovery followed Mules's evisceration.

Dr. BRONNER related a case of sympathetic ophthalmitis following a blow, which caused disloation of the lens and hemorrhage into the vitreous but without external wound. In three weeks sympathetic inflammation started in the other eye, of which keratitis punctata and papillitis were the chief symptoms.

Mr. CROSS in reply thanked the visitors and members for their valuable experience.

Dr. LODGE recounted some cases which he had **operated upon for high myopia** with good results.

Mr. RICHARDSON CROSS thought that no one who had done the operation would be likely to give it up, as the results were so satisfactory.

Mr. BRONNER read a paper on the use of **homatropine in some cases of muscular asthenopia,** where the use of correcting glasses, spherical, cylindrical, or prismatic, did not relieve the pain. The orthodox treatment was to order atropine drops, which prevented the patient from following his usual occupation for some weeks. In many of these cases the use of a 1 % solution of homatropine hydrobromate once or twice at bedtime for a week or two relieved the symptoms.

August 3d.

Mr. SIMEON SNELL, in the Chair.

Mr. E. TREACHER COLLINS read a paper on **enophthalmos,** and illustrated it with a number of lantern slides showing photographs of a series of cases that he had met with, in which it was

present. He divided the cases into non-traumatic and traumatic. Amongst the former he described cases in which the sinking of the eye was associated with other symptoms of paresis and paralysis of the cervical sympathetic such as morphæa and analgesia in the course of the fifth nerve. Also a case where the enophthalmos became converted into exophthalmos when the patient stooped or had his jugular vein compressed, and a case where the backward displacement of the eye was congenital and associated with congenitally defective movements of the eye.

He detailed five traumatic cases in three of which there were extensive scars at the margins of the orbit. In one of the others the enophthalmos had followed a blow on the cheek of the opposite side.

In two of the five cases there was anæsthesia of the face and brow of the affected side.

He compared the cases with the various theories which have been put forward to account for traumatic enophthalmos, and though he thought it unnecessary to assume that in all traumatic cases the backward displacement of the globe was produced in the same way, he considered that his five cases were best explained by the theory of Gessner, which attributed it to the contraction of inflammatory products the result of orbital cellulitis.

In the two cases in which there was no external scar, he thought the cellulitis might have resulted from a communication of the orbit with one of the neighboring air sinuses through fracture of its walls.

Deputy-Surgeon-General CAYLEY opened a discussion on **the visual tests employed in the army and navy and mercantile marine, and their efficiency.** In his paper he said that the efficiency of the men in the services depends on their eyesight being up to a certain standard. The standard of normal vision is unattainable, and men must be taken whose vision, though below normal, is up to a certain standard of practical fitness.

I.—BRITISH ARMY:

(a) *Recruits*—The test for recruits is that they shall see distinctly and count Snellen's dots $\frac{1}{4}$ inch in diam. at 10 feet. This is equivalent to seeing the 3-foot bull's-eye at six hundred yards. This minimum standard is equal to $\frac{1}{4}$ of normal sight and represents myopia of about 1.75 D. For the militia and the departments the standard is only half the above.

It is a question whether a man whose eyesight comes up only to the minimum standard is fit for service with modern long-range rifles. Defects of vision due to myopia are greatly exaggerated by conditions of fog, smoke, etc.

(b) *Commissioned Officers*—including the R. A. M. C. and the Indian medical service.

For the minimum standard the candidate must read clearly with each eye and without glasses D = 24 at 6 metres, and small type D = 0.8, and with correcting lenses must be able to read $\frac{6}{6}$ with one eye and at least $\frac{6}{12}$ with the other. He must also be able to distinguish the principal colors.

This minimum would admit of myopia = 1.75 D to 2 D. The tests employed are chiefly against myopia, and a candidate may have a considerable degree of hypermetropia. This for all out-of-door work is a less serious defect than myopia. In our army the objections to the use of glasses are very great.

The present visual standard ensures fairly useful sight both to men and officers, but it could not be safely diminished. The complaint is sometimes made that candidates, after all the labor and expense of a competitive examination, are rejected on account of defective sight. This is seldom a real ground of complaint, as the candidates are recommended before commencing study to undergo a medical examination. In doubtful cases they almost always have due warning, and if they then decide to go up it is with full knowledge of the risk of not being passed as fit. Visual tests, like other tests of physical fitness, may sometimes cause rejection of otherwise good men, but eyesight in the army is of the utmost importance, and, as a rule, men with good sight are in other respects quite as good as those with defective sight, and often better, because their powers of observation are less limited.

II.—Royal Navy:

By the Queen's regulations normal vision and normal color-sense are required for all classes, but much latitude is given to the medical examiners, and in practice a certain degree of ametropia is allowed, not only for departments, but also for ordinary seamen. It would be better if a definite standard were laid down and vision tests employed, but as the examinations are made by competent medical officers no doubt the present system works well.

For naval cadets and for engineer apprentices, normal vision

and full color vision are insisted on, the examinations being conducted by a special committee of medical officers.

III.—MERCANTILE MARINE :

For ordinary seamen and boys, no special vision tests are employed and the eyesight is not examined. This is a dangerous omission which needs the attention of the Board of Trade. Some large private shipping companies have their own rules and tests, and in some, as the White Star Line, special men are examined, selected, and paid as look-out men on every ship.

For certificated officers, apprentices, and for boys from the training ships, the tests are that he must read Snellen's test types (old edition, not the metrical) No. XL. at 16 feet. This gives a minimum vision $= \frac{1}{3}$ or $\frac{6}{18}$. If unable to read, test dots may be used.

Color sense is tested by Holmgren's colored wools. These examinations are held locally and not conducted by competent medical men and often give rise to great dissatisfaction—indeed men who have failed before the local committee have been pronounced fit on appeal to the central examining board, and probably it often happens that men passed as fit have defective sight. Unskilled examiners cannot, with any reasonable probability, exactness, or fairness, conduct visual examinations. The whole system of the standards and tests of eyesight both for officers and men of the mercantile marine is utterly defective and requires to be put upon a sound footing.

For the pilot service, as a rule, no standard of sight is required ; in a few localities a superficial examination is made. It is hardly credible that men may be certified and registered as pilots, who have defective vision and are color-blind.

For the various Indian services, definite rules are laid down.

For the civil service, any degree of ametropia is allowed, provided with a suitable lens V $= \frac{6}{6}$ in one eye and at least $\frac{6}{9}$ in the other, and that there are no active morbid changes in the fundus.

For the Indian pilot service, normal vision and full color perception are required.

With regard to the *quickness* of sight required in the case of signallers, an interesting paper on the subject was read lately by Mr. Stewart Bruce at the United Service Institution. Of men selected for the signalling classes only about 15 per cent. have sufficient quickness of sight to enable them to become efficient

signallers. Very many are good enough for slow signals but quite fail to see quick signals, at the rate of twelve or more words a minute, for which the retina has to receive and distinguish some two hundred impressions a minute. Mr. Bruce has invented an optical instrument, the "Aërial Graphoscope," for measuring the duration and persistence of retinal impressions.

Mr. T. H. BICKERTON read a paper on **color-blindness and defective vision in the mercantile marine.** Do the Board of Trade Regulations exclude the color-blind and nautically blind from the sea service?

He points out that from the Board of Trade reports, since 1877, when color tests were established, till 1898, 100,984 individuals have been tested for colors and 913 have been detected as color-blind, but there is no evidence whatever to show that these men have abandoned sea life, nor is there any provision made in the Board of Trade regulations to compel them to do so. At the present moment and under present regulations color-blind boys, "look-outs," and A. B.'s are competent to assist in the navigation of ships, and may remain in the sea profession to the end of their days; while color-blind officers who escaped detection by the old test—the *naming of colors*, established in 1877, rescinded in favor of the new test, the *matching of colors* in 1894,—and color-blind officers with endorsed certificates, are allowed to accept any engagement they can obtain either as officers or in any other capacity.

The fact that color-blind men do continue to follow sea life was so positively proved in evidence that the first two recommendations of the Royal Society's committee, appointed by the government to inquire into the whole question, were directed to their compulsory exclusion—viz.:

"(1) That the Board of Trade or some other central authority should schedule certain employments in the mercantile marine and on railways, the filling of which by persons whose vision is defective either for color or form, or who are ignorant of the names of colors, would involve danger to life and property.

"(2) That the proper testing, both for color and form, of all candidates for such employments should be compulsory."

Neither of these two recommendations have been acted upon by the Board of Trade.

The last recommendation was directed to their after-detection in case they continued to follow sea life.

"(3) That in case of judicial inquiries as to collisions or accidents, witnesses giving evidence as to the nature or position of colored signals or lights should themselves be tested for color and form vision."

As regards this last recommendation the Board of Trade writes, in answer to a letter from Mr. Bickerton, that "they are not aware of any instance in which a court hearing a collision case has considered it necessary to have witnesses tested for eyesight or color-blindness."

He gives a long list of grounds for believing that defective sight and color-blindness have accounted for, and will account for, shipping disasters.

Dr. GEORGE MACKAY wrote a paper pointing out **the defects in the examination of eyesight in the army, navy, and mercantile marines.** He quoted cases which had come under his own notice of hypermetropes of high degree admitted into the army and navy who, with advancing age, have become unfitted for their work.

He also considered that many excellent handicraftsmen are lost to the services by the unreasoning adherence to the hard-and-fast eyesight standards at present employed,—men who might be advantageously admitted if a careful consideration were made of the particular duties they had to perform, and the probable fitness of their eyes and the stability of their refraction in relation to those duties. If this were done there would not be so much difficulty in getting recruits. He censured strongly the action of the Board of Trade in using fallacious color tests, employing incompetent lay examiners, and neglecting to apply the sight tests early enough.

The committee of the British Medical Association for the better control of mariners' eyesight, in its report to the council of the Association, recommends that a representation should again be made to the Board of Trade, urging it (1) to entrust its eyesight examinations to medical men holding a certificate of proficiency, and (2) to insist on every apprentice passing an eyesight examination at the outset of his career.

A resolution was carried at a meeting of the Ophthalmological Society of the United Kingdom, January, 1895, that "no examination of eyesight is fair or satisfactory which depends merely upon the examination of form of vision by test types and dots, and *omits* an estimation of the refraction." He suggested as a

key to the problem that a few appointments be offered to well-trained junior surgeons to act as inspectors of eyesight who could train up a set of officers well fitted to advise the authorities on various points, such as (1) the best tests to employ; (2) the standards of vision demanded by various duties; (3) the propriety of permitting the wearing of glasses in certain circumstances.

Mr. MALCOLM MACHARDY severely criticised the eyesight examination of Royal Naval cadet candidates. He considered it to be mischievous and unfair, in that (*a*) it fails to exclude candidates with focus errors, even when such focus errors are calculated subsequently to impair the efficiency of the sight, and (*b*) it leads to the final rejection, on account of transitory visual imperfections, of candidates who have perfectly focused eyes and trustworthy acuteness of vision.

Lieut.-Col. E. F. DRAKE BROCKMAN considered that the standard of vision for recruits is below what it should be.

Mr. RICHARDSON CROSS said that the testing of the sight for the services should be made under absolutely fair conditions, and especially that the illumination of the test types should be constant, of a standard candle-power.

He thought that any line of passenger ships which, in addition to other recommendations, could add that the sight of its officers and men was fully assured by occasional examinations by a competent oculist, would increase largely its popularity, and other lines would have to follow suit in competition.

Dr. LANDOLT introduced *a new test type.*

It is arranged on the universally adopted principle of determining the smallest angle subtending two points, which the eye can distinguish as separate. One figure only is used, drawn in different sizes, viz., a black circle, with a gap at one part of the circumference, drawn on a white ground. The gap is in a different position in the various circles, and its size is such that for the unit of acuteness of vision, it subtends an angle of one minute. The smallest circle in which the position of the gap can be distinguished will be a measure of the acuteness of vision.

The use of a single figure is preferable to that of different letters, which vary in their legibility; it is suitable for the literate and illiterate alike, and for persons of different nationalities, also for being observed directly or through a mirror. The figures are arranged on a square sheet, which can be more equally illuminated than the usual oblong test type.

Mr. JOHN GRIFFITH read the notes of a case of **primary sarcoma of the fornix conjunctivæ.**

Dr. JAMES HINSHELWOOD read a paper on the **use of euphthalmin, new mydriatic.**

Euphthalmin produces a maximum dilatation of the pupil, while the accommodation is only very slightly affected. It causes no smarting or discomfort, it has no appreciable effect on the conjunctival vessels or corneal epithelium, the tension of the eye is not raised, nor have any toxic symptoms been observed from its use.

Dr. Hinshelwood uses a 5 % solution and instils it three times at intervals of two minutes. The maximum dilatation of the pupil is obtained in from 20 to 30 minutes, and passes off in from 8 to 12 hours. If a drop of a 1 % solution of holocain be instilled previous to the euphthalmin, the maximum effect is obtained in 15 to 20 minutes, which is the same time taken by a 1 % solution of homatropin. On the other hand, the effect on the accommodation is very slight and disappears in 1½ to 2 hours, whereas that due to homatropin lasts from 12 to 24 hours.

Mr. WATSON GRIFFIN read the notes of cases showing **the value of correcting hyperphoria, even though it be very slight in amount.** In three of his cases a prism of ½° or ¾° was sufficient to relieve the asthenopic symptoms.

Dr. KENNETH SCOTT described a case of very extensive **destructive ulceration of the eyelids,** which was cured by anti-syphilitic treatment.

Dr. G. J. BULL (Paris) wrote a paper on the **use of the stereoscope—to determine, in cases of inefficiency of the ocular muscles, the degree of ease or difficulty with which binocular vision is obtained.**

Dr. HERN wrote a paper describing **some of the ocular symptoms in hay fever.**

Mr. ARNOLD LAWSON wrote a paper on the **correction of refractive errors in the treatment of trachoma.**

He gave the notes of two of his cases, in which the ordinary treatment for trachoma had been carried out for long periods without benefit—including the wearing of protective glasses. On correcting the high degree of ametropia—H., M., or Ast.—which coexisted, the improvement was very marked.

REPORT OF THE PROCEEDINGS OF THE NINTH INTERNATIONAL OPHTHALMOLOGICAL CONGRESS, UTRECHT, AUGUST 14–18, 1899.

By Prof. R. GREEFF, Berlin.

Translated by Dr. Ward A. Holden.

The congress was opened at a general session in the aula of the university with addresses by A. Robertson, president of the preceding congress, and Snellen, president of the present congress. On account of the quantity of scientific material offered it was decided to divide the proceedings into three sections:

Section A, of anatomy and demonstrations.

Section B, of biology and optics.

Section C, of clinical and therapeutical communications.

This arrangement, although it saved a great deal of time, was, in the opinion of most of those attending, unsatisfactory. It was too difficult to select the papers in which one was most interested and, furthermore, the continual running back and forth was disturbing. It would probably be better in the future to arrange the papers according to subjects instead of allowing them to be read in the order in which the titles are sent in.

Otherwise everything was well arranged and none who took part will forget the pleasant days spent in hospitable Holland. The congress was well attended by oculists from all parts of the world.

AUGUST 15TH.

GENERAL SESSION.

Priestley Smith (Birmingham): **The treatment of squint in children.**

The author had studied 576 cases of squint and was able in 347 cases to determine the time at which the squint began. He con-

cludes that it begins usually at a very early age and therefore the treatment is usually undertaken too late. The results are better the earlier treatment is begun. In most of his cases the children began to squint in the third year. In 68 per cent. of all cases treatment was begun a year or more after the first symptoms appeared. This disposition to wait in cases of squint is explained by the fact that many cases recover spontaneously and by the generally accepted idea that an operation is always required.

Loss of fixation is only found in unilateral constant squint. It appeared 250 times—*i. e.*, in nearly one half of all cases there was false fixation. This is found especially in those cases which came on in the first two years of life and is rarer in cases developing later. It is almost constantly absent in cases developing after the sixth year. Loss of normal fixation is therefore a secondary and not a primary symptom. Normal fixation develops in the first year of life, and is lost the more readily the shorter time it has existed. The amblyopia is probably associated with the imperfect development of the faculty of vision in the squinting eye. This matter is hard to determine, however, since we cannot measure the vision of the new-born.

In 96 patients orthoptic treatment was undertaken before the fourth year. It cannot be denied that covering the non-squinting eye is often of great benefit. Among the patients with false fixation 5 regained normal fixation after wearing correcting glasses. In one of these children complete binocular vision had been gained. The older the patient the more difficult is it to restore normal fixation. The treatment therefore must be begun early.

SESSION OF SECTION A.

EINTHOVEN: **Geometrico-optical illusions.**

The author spoke of his investigations in this matter which had already been published. He explained the illusions by the seeing in diffusion circles. When these illusions are projected in diffusion circles the figures are actually changed in the way in which we believe we see them.

Discussion.—SCHOUTE: I have studied the effect on the Müller-Lyer illusions of moving the eyes and have come to conclusions agreeing with Einthoven's theory. But when I direct my gaze about the figure the illusion is somewhat more marked than when I fix my gaze on the middle point of the figure, while

Einthoven regards movement of the eyes as a factor tending to lessen the illusion.

NUEL: **The channels of elimination of the aqueous from the anterior chamber.**

The author injected some drops of India ink in the vitreous of living animals and examined the eyes at varying intervals thereafter. Similar experiments were made on normal human eyes which were to be enucleated on account of orbital tumors. In one case the injection was made 2½ hours before enucleation, in the others, 4 hours.

In the experiments on human eyes it was shown that the India ink was carried to the anterior portions of the ball and into the anterior chamber. Thence it passed almost exclusively into the iris, where one found a thick layer of pigment in the deep layers of the iris, separated by a thin layer of uninvaded tissue from the pigment epithelium. Only in two places, the periphery of the iris and the pupillary margin, did the coloring matter extend to the anterior surface of the iris. These two points form the entrance passages for the pigment, and correspond to the stomata described by Fuchs. The ink also collects about Schlemm's canal, without, however, entering it. Furthermore, the ink enters the ciliary body through the ciliary processes and collects in the walls of the vessels. It did not appear to enter the sclera.

In animals the iris seems to play a less important rôle in the absorption of the aqueous. A certain amount of ink enters at the root of the iris in the dog and a certain amount through the anterior surface of the iris at the pupillary margin, and from these points is diffused in a lessening stratum in the substance of the iris. In the cat the ink enters a number of stomata in the anterior surface of the iris at its periphery. In the rabbit, no ink had been found in the iris, which here seems to play no part in the absorption of the aqueous. In the chicken the ink appeared in numerous stripes throughout the entire extent of the anterior surface of the iris.

In all the eyes examined, both human and animal, the pigment followed the course of the blood-vessels and was deposited in their walls without entering the vessel lumen. This was also the case with Schlemm's canal. The walls of the vessels seem to form a fine filter which allows the passage of liquids but stops even the smallest particles of India ink. In man, therefore, the

iris forms almost exclusively the channel for the elimination of the aqueous, and if other authors performing the same experiments have come to different results it is because they have used rabbits for their experiments, and in this animal the iris plays almost no part in the absorption of the aqueous.

BENOIT: **Channels of elimination at the posterior pole of the eye.**

There are two channels of exit at the posterior pole of the eye, one from the vitreous through the optic nerve to the intervaginal space, the other consisting in a communication between the suprachoroidal space and the intervaginal space about the nerve head.

The first-named passage was demonstrated in the rabbit by Gifford, Ulrich, and Stilling. In the author's specimens India ink injected into the vitreous of the rabbit filled the circumvascular spaces of the central artery and finally collected in the sheath of the optic nerve. Experiments made on dogs and cats and on human eyes showed, however, that this channel of elimination existed here in but very slight degree, or not at all. The latter fact is of especial importance in the question of glaucoma, since the findings in rabbits had been taken to represent the conditions existing in man.

As to the second channel of elimination, the suprachoroidal space is embryologically a continuation of the subdural space, and in rabbits a direct free communication can be demonstrated. According to Michel and Schwalbe, this is also the case in man, but the communication is much less free.

SESSION OF SECTION B.

TSCHERNING: **On the accommodative changes in the eye.**

It has been known for years that in accommodation the reflex image from the anterior surface of the lens moves toward the median line of the eye. At the end of accommodation the image from the posterior surface of the lens moves downward independently of the position of the eye. It is not yet certain whether this indicates a displacement of the lens as one might readily suppose. Other circumstances make it appear probable that slight movements of the eye are accountable for it. The movement takes place in a curved line. It is better seen in the posterior

image than in the anterior, the excursion of the latter being about one quarter of the former.

PFALZ: **On perverse astigmatism.**

Astigmatism against the rule, which was formerly regarded merely as an unusual form of astigmatism, has through the labors of various writers come to have a greater biological importance. The author's conclusions are as follows: 1. Astigmatism against the rule is not a congenital defect but an anomaly of corneal curvature appearing with advancing age. 2. The change in corneal curvature begins in youth in the sense of a decrease in the astigmatism according to the rule. It would appear that a flattening of the vertical meridian plays an important rôle, as this was often found. 3. Besides the curvature of the cornea the lenticular astigmatism, which is always against the rule, plays a more important rôle with advancing age. Sulzer's view, that all differences between central corneal astigmatism and total astigmatism are due to an excentric corneal astigmatism, is held to be incorrect. A marked excentric astigmatism against the rule may in early life be of optical significance, yet the author believes that in such cases the excentric astigmatism against the rule of the cornea makes it probable that there is a marked curvature of the lens against the rule. The fact that in the young without a central corneal astigmatism there is so rarely a total astigmatism against the rule, while in older persons this is so frequent, the author ascribes to the tone of the ciliary muscle and the greater elasticity of the lens, whose astigmatic curvature against the rule may only become optically manifest in later life. 4. Astigmatic accommodation plays a rôle in early life, but only in the sense of a lenticular astigmatism against the rule acting to correct a corneal astigmatism with the rule. The author has never seen a corneal astigmatism against the rule corrected by a lenticular astigmatism of the opposite sort, and this he considers impossible, owing to the form and elasticity of the lens.

As the causes of the change in corneal curvature the author cites diminished resistance of the cornea from general disturbances of nutrition, decreased elasticity of the ocular capsule, and perhaps, also, according to Gould, a lessening of the fatty cushion of the orbit, and the diminished resistance of the cornea from senile degeneration. Corneal astigmatism against the rule in early life is pathological, as shown by the facts that if present it is

usually of high degree, and there is usually a marked diminution in acuteness of vision.

SESSION OF SECTION C.

SCHIRMER: **On benign post-operative cyclitis due to infection.**

In the course of a year Schirmer had sixteen cases of post-operative cyclitis which were midway between those severe infectious troubles that destroy the eye and the mild irritation of the iris which follows mechanical and chemical insults. The inflammation appeared as a serous cyclitis with numerous deposits on Descemet's membrane, beginning ten to twelve days after the operation, lasting two or three weeks, and being cured by atropine, hot fomentations, and salicylates without injury to the sight. It was finally attributed to the faulty preparation of a 3-per-cent. solution of boric acid in which the cotton used for sponging was dipped. Since this solution had been systematically boiled a hundred extractions had been done without any signs of infection. Therefore the author concludes that, in spite of its benign course and long stage of incubation, the inflammation was due to infection during the operation.

Discussion.—KNAPP, GUTMANN, and GOLDZIEHER called attention to the fact that with inflammations of this sort there is frequently increased tension, as Schirmer noted in several of his cases, which, however, yielded to the use of eserine.

UHTHOFF asked if the improperly prepared boric-acid solution had been examined bacteriologically, and was answered in the negative.

STRAUB: **On hyalitis.**

Straub called attention to the fact that at the Heidelberg meeting in 1896, he had expressed the opinion that from the present view-point of inflammation hyalitis should be sharply differentiated from cyclitis or general uveitis. Since then he had studied the matter from a clinical standpoint and had found that the symptoms of experimental hyalitis could be found in clinical cases also. Such symptoms were exudation into the vitreous, fibrin in the pupil, adherence of the margin of the iris to the capsule of the lens, filling of the posterior chamber with exudation, hypopyon, increased tension in the beginning, and later hypotony.

He analyzed twenty-seven carefully observed cases which formerly would have been called iritis, irido-choroiditis or cyclitis,

glaucoma, or panophthalmitis. A separation of the cases of hyalitis has the advantages that the prognosis can be made more accurately and that oculists would be forced to study true cyclitis and uveitis more carefully, whereby more information in regard to sympathetic ophthalmia might be gained.

Discussion.—SCHMIDT-RIMPLER confirmed the possibility of the existence of inflammation of the vitreous, but doubted whether it was possible to separate it clinically from iritis and cyclitis, since the clinical symptoms were so similar.

GREEFF also admitted the existence of hyalitis.

SCHIRMER stated that one could not speak of inflammation of a membrane when only leucocytes had wandered in from other parts. The cells of the membrane itself must show inflammatory changes, and such changes have not yet been found in the cells of the vitreous, wherefore Schirmer does not accept this diagnosis.

SCHOEN: **On scleritis and its relation to myopia.**

The changes which occur in the elongating of the eye are three. The first is the purely mechanical distortion due to convergence, the second the purely mechanical stretching of the choroid to cover the greater area. These were brought forward by Schoen in 1893, and he now adds a third after finding that scleritis is never an independent affection but one always complicated with adhesions to the sclera. An evident sign of previous scleritis is the adhesions always found between sclera and choroid in myopia of high degree.

Discussion.—UHTHOFF called attention to the late publication by Heine in which the doctrine of the displacement of the optic nerve sheath is refuted. He finds a progressive atrophy of the choroid at the position of the conus. Uhthoff asked what anatomical proof Schoen had of a true inflammation of the sclera, upon which Schoen again called attention to the adhesions between sclera and choroid.

E. TREACHER COLLINS: **Anatomy and congenital defects of the ligamentum pectinatum (with lantern slides).**

MULDER: **Pathologico-anatomical demonstrations.**

OLE BULL: **Drawings and chromatic tables.**

DIMMER: **The photography of the fundus.**

Dimmer has obtained photographs 36 *mm* in diameter and covering a field of 4 disc diameters, in which no corneal reflex is visible.

The illumination is obtained through reflection in a glass rod

which is held before one half of the dilated pupil and covers the corneal reflex. The inverted image is photographed with a Zeiss anastigmatic lens. The source of light is an arc lamp, and the exposure is 4–5 seconds. All lateral light is cut off and the head is fixed in a holder.

The present non-uniform illumination will be avoided in the perfected instrument on which the author is now at work and with which he expects to photograph pathological cases.

DOR: **Projections of colored photographs from nature.**

AXENFELD: **Pathologico-anatomical demonstrations.**

1.—*Miliary tubercle of the lachrymal gland in a case of general miliary tuberculosis.* This proves the existence of endogenous tuberculosis of the lachrymal gland. Since the author found the lachrymal gland free from tubercles when tuberculosis of the conjunctiva had existed for years, it is probable that most cases are not primary and ectogenous, but secondary and endogenous.

2.—*Glaucomatous excavation of the lamina cribrosa, without excavation of the disc.* The peculiar condition was found in an eye in which inflammatory glaucoma had existed for two weeks. It was probably to be explained as having been an optic neuritis with swelling of the disc, which had been pushed back by the increased tension, causing an excavation of the lamina cribrosa.

3.—*Preparations showing regeneration of the nerves after optico-ciliary neurectomy and of the anterior perforating ciliary nerves* (*cf.* paper).

Axenfeld demonstrated also a portable binocular Westien's loupe whose tubes can be moved to directions radiating from the point of fixation at 25 *cm* distance to fit any interpupillary distance. With this loupe one can work for hours without fatigue.

SECOND DAY'S SESSION, AUG. 16TH.

LEBER: **On the nutritive relations of the eye.**

The purpose of this paper was to discuss some of the questions of general interest in regard to the nutrition of the eye, supporting them on new experiments, which, however, were confined to the cornea, lens, and vitreous.

The author began with the exchange of liquids in the eye in general, and the purpose of this exchange to preserve the optic apparatus in an unchanged condition, assuring constancy of curvature and transparency of the refracting media. This is

subserved by the intraocular tension. The secretion of the liquid maintaining this tension is proportional to the difference in pressure between the contents and the surroundings of the vessels. A filter for the components of the blood which do not pass into the aqueous humor is the vessel wall. It is doubtful whether the epithelium of the ciliary processes takes any part in this.

The ciliary processes form the true secreting organ of the intraocular liquid.

It is not true, as supposed by Ehrlich and Hamburger, that the anterior surface of the iris takes part in the secretion of the aqueous. Leber has convinced himself of this by various experiments on animals, and the experiments of others have shown in fact that the anterior surface of the iris serves to absorb the aqueous humor.

That the ciliary processes form the secretory organ of the intraocular liquid is proven, finally, by the fact that in congenital irideremia, and after complete loss of the iris from trauma, the intraocular tension is normal, while secretion of intraocular liquid ceases entirely after the experimental removal of the iris and ciliary processes.

The preservation of tension at a constant height requires that the elimination of the aqueous should be retarded. Besides the well-known filtration into the circulus venosus, there is a slight outflow from the central canal of the vitreous in the circumvascular sheaths of the central vessels of the optic nerve.

For the preservation of the intraocular tension the marked capacity of the cornea for swelling up is of importance. Both epithelium and endothelium serve to prevent an excessive absorption of liquid which would interfere with the transparency of the cornea.

The liquid contained in the cornea is not free but physically absorbed, and only traces of it can be squeezed out by ordinary pressure. If the cornea is swollen with liquid this may readily be expressed with slight pressure.

The author then passed to the subject of the nutrition of the tissues, and combated the view that every part of the body, even if it performs no work and needs no nutrition, must nevertheless be in a constant state of restoration and require a constant nutritive supply.

This idea can hold good only for the cells and other actively

functionating elementary organisms and not for the intercellular substances. The nutritive requirements of the cornea, lens, and vitreous are very slight and can be supplied wholly by means of diffusion. The fact that such parts are not vascular is rather an advantage, since an excess of nutritive material is prevented. The nutrition through diffusion is seen most clearly in the case of the lens, surrounded by its closed membrane.

Conduction takes place through the intercellular substances. In the epithelium this takes place through the intercellular spaces, which make up a communicating system which becomes dilated with the excessive conduction of nutritive material, as in inflammation of the cornea. There is no circulation in this system of cavities, since there is no free outlet.

In tissues with a fibrous intercellular substance the conduction of nutritive material generally takes place through the cavities in the tissues which are filled with liquid.

The process in the cornea, however, is peculiar in that conduction does not take place through such cavities or canals, but by diffusion through the entire intercellular substance. The absorption and spreading of soluble, diffusible substance in the living as well as the dead cornea may be followed by means of chemical reactions. Such substances spread first through the intercellular substance and enter the cells later if at all. In this way are produced the negative impregnation pictures of the cornea.

The nutritive substances follow the same course. The capsule of the lens and Descemet's membrane are pervious to albumen. In inflammatory processes the intercellular substance of the cornea is soaked with albuminous and fibrinous liquids. The nutrition of the cornea is for the most part provided for by the marginal vessels, yet the aqueous humor may take some part in the process.

The vitreous consists of a fibrillar framework filled with liquid which escapes on incision or after opening the anterior chamber, the liquid in the latter case filtering through the zonula. The source of the liquid is the same as that of the aqueous. The more albuminous nature of the vitreous can be referred to diffusion from the surrounding parts. This view is supported by the fact that after removal of the ciliary processes not only is the aqueous not restored, but the vitreous rapidly disappears entirely, without any signs of inflammation.

MICHEL : **On free metastases from ocular tumors.**

Michel described three cases of tumor of the eye : 1. An epibulbar large-celled alveolar sarcoma developed first on the temporal side, then on the nasal. At the same time there appeared in the cornea beneath its centre a minute gray nodule which microscopic examination proved to be sarcomatous, it having in some parts an alveolar structure like the epibulbar nodules. The corneal nodule lay beneath the superficial layer of epithelium in the otherwise normal cornea. It is probable that sarcoma cells were loosened from the primary nodules and lay in the conjunctival sac, or that the prominent epibulbar nodule was forced over the cornea by a movement of the lid which rubbed away the epithelium and at the same time inoculated the cornea. 2. A metastatic carcinoma of the choroid had spread along one of the vena vorticosa into the sclera. A small carcinomatous tumor was found also in a niche between two ciliary processes which were otherwise normal, the tumor having probably arisen from carcinoma cells which had become detached from the main tumor and, floating free in the vitreous, finally lodged between two ciliary processes. 3. An epibulbar, small-celled sarcoma appeared first on the nasal side, then on the temporal. The enucleated ball showed that the entire uveal tract was pervaded with sarcoma cells, particularly the ciliary body, from which extension was taking place along the vessels and nerves. On the posterior surface of the cornea sarcoma cells were found, both in small nodules and in layers one or more cells deep. The endothelium and the cornea itself seemed normal. It is likely that cells from the iris and ciliary body became mingled with the aqueous and found on the posterior surface of the cornea favorable conditions for further growth.

From all this two conclusions may be drawn : (1) that in cases of ocular tumor a free development of metastatic tumor elements may take place, and (2) that the growth of the metastatic elements takes place in a form which corresponds to that of the original tumor.

SIEGRIST : **A contribution to the knowledge of arterio-sclerosis of the ocular vessels.**

The author observed, in a man of sixty-five and in a woman of fifty with general arterio-sclerosis of high degree, a peculiar ophthalmoscopic change : besides some completely sclerosed choroidal vessels, others were of normal red color. On some

branches of the latter vessels were deposited wreath-like patches of pigment of various sizes.

The male patient died some months later, and the cerebral arteries showed a high degree of endarteritis. Within the elastica were numbers of vesicular, and often multinuclear, cells of epithelioid appearance, which narrowed the vessel lumen. Within these accumulations of cells were two or three layers of spindle-shaped endothelial cells surrounding the lumen.

In the eyeball the cause of the wreath-like pigment patches was found to consist in a proliferation of enlarged pigment epithelial cells immediately above certain diseased choroidal vessels. These new-formed epithelial cells had not altered the overlying layers of the retina. The underlying vascular changes consisted in sclerosis of the vessel wall, or in an endarteritis obliterans from hyaline degeneration, or, finally, in a peculiar form of endarteritis with large epithelioid cells between the endothelium and the elastica, such as was found in the cerebral arteries.

GOLDZIEHER: **On iritis glaucomatosa.**

Goldzieher observed five cases of iritis which were characterized by the sudden development of increased tension. In each case there had been a previous attack, and the second attack came on suddenly without attributable cause, with ciliary injection, synechiæ, and exudation. Then after some weeks the clinical picture suddenly changed, the pain became more severe, the cornea cloudy, the conjunctiva chemotic, the pupillary exudation fibrinous, and vision sank to perception of light.

The course was in all cases favorable; under the use of miotics and hot applications each case was cured without operation. With the action of the miotics the fibrinous deposits in the anterior chamber became more numerous. Goldzieher believes that the increase in tension may have been due to a coagulation of the fibrinous exudation in the lymph channels of exit, rendering them impervious. [Spongy iritis, H.K.]

SCHOEN: **The three essential anatomical changes in glaucoma.**

Besides the two changes previously described in glaucoma, viz., the production of an excavation with an angular bending of the optic-nerve fibres, and the displacement of the ora serrata from muscular traction exercised through years, Schoen now describes as a third change the atrophy of the ciliary muscle. Instead of

the tense muscle bundles one finds relaxed, tortuous, empty tubules, whose transition to tendon fibres cannot everywhere be followed. The interstices between the muscle bundles are occupied by a hyaline material. The process is one of simple muscular atrophy, in conjunction with myositis interstitialis fibrosa. This atrophy is brought about by repeated over-fatigue.

Discussion.—HESS opposed the view that the angular bending of the optic-nerve fibres was due to muscular traction, since he had found this condition in the new-born when otherwise the eyes were normal. Furthermore, Hess and Heine, repeating the Hensen-Völkers needle experiment in the eyes of monkeys, found that the accommodative displacement of the ciliary muscle under electric excitation ceased shortly behind the equator of the eye, and, therefore, the assumption of muscular action in the region of the disc was entirely unjustified.

HESS: **On the relation between accommodation and convergence.**

Hess, in his investigations, proceeds from a fact which he has discovered, that it is easily possible to contract the ciliary muscle sufficiently to allow the lens to assume its maximum curvature, the zonula being entirely relaxed. By new methods of investigation he has been able to demonstrate that the customary distinction between a binocular and a uniocular near point does not agree with the facts. In fact both lie practically at an equal distance from the eye. The difference is only an apparent one, due to the fact that in the usual methods of measurement the uniocular near point is determined with a much smaller pupil than the binocular. Hess was able to show, further, that Donders's well-known curves of the relative range of accommodation furnish an incorrect picture of the connection between convergence and contraction of the ciliary muscle and that the different segments of the curve correspond to entirely different relations. This connection follows, according to Hess, the following law: "With every convergence is associated a medium accommodation of particular degree. This may increase or diminish within certain limits while convergence remains fixed. The amount of this variation is approximately the same for all degrees of convergence, *i. e.*, the play of accommodation with a given convergence is independent of the absolute degree of convergence."

In conclusion, Hess states that eserine does not increase the actual range of accommodation, as has been generally supposed, the apparent increase depending upon the narrower pupil.

G. J. Bull: **Fatigue from the effort to maintain binocular vision.**

One of the principal causes in bringing about a disturbance of binocular single vision is a difference in the refraction of the two eyes. On account of the difference in the images the accommodative effort is increased, and this leads to an unequal distribution of the motor impulse to the intrinsic muscles of the two eyes. The author referred to a stereoscopic apparatus for determining the amplitude of fusion, and the ability, with or without difficulty, to fix.

The subjective symptoms of which the patient may complain in such cases are not to be neglected. The author described the symptoms that are of diagnostic value, and called attention to the efforts which such a patient must systematically make in order to maintain binocular vision. The chief result of such efforts is a spasm of the ocular muscles; this local condition of spasm may give rise to a general tendency to spasm which may cause spasm to appear in any portion of the body.

To illustrate his statements, the author described a case in which the local strain existing for years had brought about marked signs of neurasthenia, and proper treatment with the purpose of relieving the effort involved in binocular vision led to the patient's recovery from the general symptoms.

Sattler: **On cataract from iron.**

Sattler spoke of that form of traumatic cataract which is found six months or more after the entry of a splinter of iron into the lens, to which the iron gives a characteristic brownish color. In other forms of traumatic cataract, when the absorption of lens masses has not progressed far, the simple linear extraction which is employed in myopia of high degree is the best procedure, but in iron cataracts, even when in young persons, the curved section, as in senile cataract, is indicated.

Such lenses become, through the chemical action of the iron, denser and more coherent, so that they are usually readily delivered like a senile cataract.

The characteristic symptom of an iron cataract is a pronounced brownish discoloration in the neighborhood of the splinter. There is no great swelling of the lens, and a lustrous surface and indications of a radial figure are usually to be seen. Reddish-brown spots on the anterior capsule are not pathognomonic of iron cataract, since these may be present in cases in which the

iron lies in the deeper portions of the eye. Microscopically the lens fibres near the foreign body are found to be well preserved, as is often the entire lens, and vacuoles among the fibres are few or altogether wanting. Ferrocyanide of potassium and hydrochloric acid give the Prussian-blue reaction near the foreign body.

A. v. HIPPEL: **The permanent results of myopia operations.**

Hippel reports his experiences in the last six years. Within this period he has operated on 188 eyes, all but 4 of which have remained under observation for a considerable time.

He has had detachment of the retina in 10 cases (5.4 %), this occurring in 3 cases after three or four years, in 6 cases after one year, and in 1 case after eight months. Among 1747 highly myopic eyes, 117, or 6.7 %, had spontaneous detachment without operation. This favorable relation changes when one divides the patients according to their ages, since for those under thirty the percentage of losses is less favorable to the operation, while for those over thirty it is more favorable. In some cases opacities appeared in the anterior segment of the vitreous after operation, dependent upon chronic uveal inflammation. The operation does not offer a safeguard against detachment or central choroiditis. In none of Sattler's cases had the refraction found after the operation increased. The permanent acuteness of vision was reached about a year after the operation; this varies greatly, however, with the illumination.

In the *discussion* SATTLER and PFLÜGER agreed with Hippel's views. Pflüger believed that the opacities in the anterior portion of the vitreous were due to a too early discission.

OBARRIO: **On the maximum of acuteness of vision.**

The author's method of determining the acuteness of vision depends upon the observation of the minimum of deviation obtained when a ray of light is divided into two parts. The two parts remain exactly parallel. Under these conditions the author found that the minimum deviation for white light corresponded to an angle of 12 seconds.

COPPEZ (Brussels): **On the effect of toxins upon the cornea.**

One should first seek to find out in what way toxins produced in the conjunctival sac may affect the cornea. Diphtheria of the conjunctiva may be selected as a typical disease. A por-

tion of the toxin passes into the general circulation; another portion mixes with the tears and is carried over the bulbar conjunctiva and cornea. There is but little absorption through the bulbar conjunctiva, the toxin acting chiefly upon the anterior surface of the cornea. The epithelium offers an obstacle, but as soon as it is altered absorption takes place freely. The change in the corneal epithelium may be caused by treatment or by the action of the toxin itself, which loosens the epithelium in forty-eight hours.

Coppez's experiments taught him that the tears do not have an antitoxic effect on the diphtheria toxin, as Gosetti believed. The toxins do not contract the circumcorneal vessels, but rather dilate them.

DARIER: **Massage in ocular therapy.**

Darier spoke of the various sorts of ocular massage used by the ancients, and then took up the vibration massage of Maklekoff and the pressure massage of Domec. The latter acts well in accommodative asthenopia, in hyperopia in the young, and even in some cases of strabismus. In myopia, massage is supposed to have a stimulating effect upon the ciliary muscle.

JOCQS (Paris): **A method of rendering the lens quickly and completely opaque without rupturing the capsule.**

Jocqs has tried the following experiment on dogs and rabbits: After anæsthetizing the cornea and dilating the pupil, he punctures the anterior chamber with a hypodermic syringe having a fine canula, and draws up some drops of aqueous humor which he then, without removing the syringe, injects deep into the lens. In from two to five days afterward the lens has become entirely opaque, and can be removed exactly like a soft cataract. The operation has not yet been done on man.

VALUDE (Paris): **The bactericidal action of the tears.**

From a series of experiments Valude concludes that the tears form a very poor culture medium for micro-organisms, and that it is even possible in this way to neutralize the virulence of some varieties, such as the bacillus of splenic fever, the bacterium coli, and even, to some extent, the staphylococcus aureus. It is important to determine the alkalinity or acidity of the tears in their germicidal action, but this was not done in the author's experiments. Clinically, the author had given this subject some attention, always testing the reaction of the tears with litmus paper before his cataract operations. In three cases among

eighty, in which the tears had an acid reaction, the author had infection in spite of all attempts to prevent it, but the eyes were not lost.

DIANOUX (Nantes): **On the treatment of corneal infiltrations with sea water.**

After the author had tried all the usual subconjunctival injections in cases of infiltration of the cornea and had discarded them, he took up sea water on account of its chemical similarity to human serum. This was injected subconjunctivally and caused little pain or reaction. These injections may be repeated daily for one or two weeks.

GENERAL SESSION, AUGUST 17TH.

PANAS. **On traumatic paralyses of the ocular muscles.**

The tearing of the tendon loose from the sclerotic, which is frequently given as the cause of traumatic paralysis of the ocular muscles, must first be proven to take place; in general, at any rate, this explanation is wrong. Among the traumatic paralyses of nervous origin are those due to rupture of the nerve trunk at the base of the skull, which are much more frequent than nuclear paralyses. From the tenth year to old age traumatic paralysis of an ocular muscle is usually due to a fracture of the base, frequently through the petrous portion of the temporal bone, and more rarely to simple hemorrhage or meningitis. The contrary is the case in young children, in whom a lesion of one of the sinuses, particularly the inferior petrosal, is the chief cause. Congenital concomitant strabismus occurs and may be caused by mechanical pressure on the nerves in their intracranial course from meningeal hemorrhage.

NEUSTAETTER (Munich): **Injections into the lachrymal canaliculi without the use of a canula.**

Neustaetter finds that if a syringe with a 1 *mm* canula is placed over one punctum while the lid is everted slightly the liquid can readily be forced into the canaliculus.

DRUAULT (Paris): **On the colored rings which are seen about a flame in normal pathological conditions.** The relation between the extent of the colored ring and the elements which produce it allow us in some cases to determine the place in which the ring arises. These physiological and pathological rings are very numerous and I will confine myself to those seen in glaucoma and to two physiological ones. One of the physiological

rings is due to the fibrillar structure of the lens. Some persons see this ring when their eyes are in normal condition and most persons see it when the pupil is dilated. The instillation of a drop of cocaine is usually sufficient to bring it to view. The diameter of this ring is about 6°; it disappears on both sides at once when more than half of the pupil is covered with a screen. The second physiological ring is somewhat smaller, measuring only 4° in diameter. This arises from the posterior epithelium of the cornea. It is easily demonstrated on a cornea that has been removed from the eye. The glaucomatous ring is usually due to cloudiness of the deep layers of the cornea, but it has been attributed to the lens. It can readily be shown that it is entirely different from the lens ring. Its diameter is 8°. Computation shows that the elements which bring it about have approximately the size of the epithelial cells of the deep layers.

Dor (Lyon): **On the nervi nervorum of the optic chiasm.** Besides two small bundles of nerves which arise from the carotid plexus and run to the lateral angles of the sheath of the chiasm, there is a considerable number of fibres which arise from the suboptic gray layer and run to the pial sheath of the upper portion of the chiasm. Part of these fibres cover the chiasm in front, forming Hannover's commissure, but another part appear again in the sheaths of the optic nerves and mingle with their fibres after passing through the sheath. These are fibres of centrifugal conduction, since they do not atrophy after enucleation. They appear to be the chief nervi nervorum of the optic nerves, and we believe that the changes which these fibres must suffer where they pass over into the suboptic gray matter, since there is an increase in the cerebro-spinal fluid, must be the cause of the œdema and swelling of the optic disc observed in cases of brain tumor.

Kempner: **A new instrument for detecting hemianopic pupillary reaction.**

Wernicke found that in hemianopsia due to lesion of the tract the pupils did not react when light was thrown upon the blind halves of the retinas. It is very difficult, however, to illuminate the blind half without letting some light fall upon the seeing half and bringing about contraction of the pupil. Fragstein and Kempner, therefore, constructed an instrument for this purpose as follows[1]: A hollow cylinder was provided with a conical process with its apex anterior, having a 1 *mm* opening. In the cylinder is

[1] *Zehender's klin. Monatsbl.*, July, 1899.

an electric light before which are two plano-convex lenses of 50 *mm* focus. When the light is turned on, a strip of light 4–5 *mm* long and 3–4 *mm* broad appears at a distance of 5 *cm* from the small cylinder. With this it is very easy to determine whether or not there is hemianopic pupillary reaction. [1]

LANS. **On the width of the pupil.**

In connection with the experiments of Schirmer and Silberkuhl Lans proposed the question, "What is the width of the pupil between 0–1000 meter candles, leaving out of consideration convergence, accommodation, psychic and sensory excitations, and maintaining full adaptation?"

His experiments were divided into three categories:

1. Determination of the width of the pupil after adaptation for 0 M. C.

2. Determination of the width of the pupil after adaptation for 0–25 M. C.

3. Determination of the width of the pupil after adaptation for 0–1000 M. C.

The results were as follows: After fifteen minutes' adaptation for complete darkness Lans's pupil had a horizontal diameter of 7.8 *mm*.

In the second category it was found that the width of the pupil corresponded to the intensity of the light.

In the third category the diameter of the pupil after complete adaptation for 25–1000 M. C. became less, the reduction being greater in the beginning. The results were demonstrated graphically, and showed a remarkable correspondence between the course of the lines representing the acuteness of vision with increased illumination, and those that were found for the diameter of the pupil after adaptation for equally strong light intensities.

HAAB. **On intraocular disinfection.**

Haab stated that for several years, and for two years before Ostwalt recommended iodoform, he had used it in cases of tuberculosis and for preventing suppuration after operations, and for the past year for developed purulent inflammations after traumatic or operative wounds. Basing his views on the good results obtained in seventeen cases in which he had introduced iodoform in the form of small pills into the anterior chamber or into perforating wounds, he concludes that iodoform has unjustly been dis-

[1] A similar but simpler instrument was devised for the same purpose several years ago by Henschen.—*Trans.*

credited and that it is of great service in purulent inflammations. It is well borne in the anterior chamber, and may remain for a long time without causing much irritation. It may perhaps serve as a preventive of sympathetic ophthalmia.

Discussion. — Several persons doubted the specific bacterial action of iodoform. Wicherkiewicz spoke of the good effects obtained by injecting protargol.

(To be continued.)

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE SECOND QUARTER OF THE YEAR 1899.

By Dr. ST. BERNHEIMER, in Vienna; Dr. O. BRECHT, Prof. R. GREEFF, Prof. C. HORSTMANN, and Dr. R. SCHWEIGGER, in Berlin;

WITH THE ASSISTANCE OF

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Translated by Dr. Ward A. Holden.

Sections I.–III. Reviewed by Prof. HORSTMANN.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

186.[1] Kramer. The animal parasites of the eye. *Graefe-Saemisch Handbuch.* 2d edition, 9th, 10th, and 11th parts. Leipsic, 1899. W. Engelmann.

187. Fick. Hygiene of the eye. *Ibid.* 12th and 13th parts.

188. Elschnig. Normal anatomy of the optic-nerve head. Comparison of ophthalmoscopic and anatomical findings. *Charts for Ophthalmological Instruction.* Edited by Magnus. Part xvi., Breslau, 1899. Kern.

[1] The titles of the report for the first quarter of 1899 were numbered 631–816 instead of 1–185.

189. SCHANZ. The bacteria of the eye. *Ibid.* Part xvii.

190. TERSON. Notes on ancient ophthalmology. *Arch. d'opht.*, xix., 6, p. 337.

191. JENSEN. Some ocular examinations of the aged. *Hospitals-tidende*, June 28, 1899.

192. GUILLERY. Remarks on acuteness of vision and marksmanship. *Deutsche militärärztl. Zeitschr.*, 1899.

193. WESTHOFF. Charitable policlinic in Amsterdam. Report for 1898 (1539 patients, 18 cataract operations).

194. GOERTZ. 5th annual report of the ophthalmic institute at Landshut, 1898.

TERSON (190) in his paper writes of the scientific importance and activity of a number of oculists who lived in the period from the time of the Arabs to the 18th century—from the time of Mandeville and Guy de Chanliac to Daviel. Even Fracastor recognized the nature and proper treatment of the contagious eye diseases and strove to prevent them. He endeavored to obtain antisepsis before and after his operations. A special cleansing of instruments was certainly neglected, as Verduc states that operators were accustomed to polish their cataract needles on their sleeves before operation. Paré mentioned the connection between ozæna and affections of the lachrymal sac. Fabricius ab Aquapendente considered in detail wounds and foreign bodies of the orbit and mentioned their danger as regarded the brain. He was the first to write of sympathetic ophthalmia. In regard to cataract operations he was very anxious and appears to have had poor vision himself, since he states that the operator must fix the patient so accurately that his own eyes even might be injured. A clever surgeon and operator on the eye was Franco, who recommended doing operations on the eyes of animals for practice.

The older eye specialists (often polyspecialists, such as cutters for stone, obstetricians, and dentists) were held in much lower regard than the surgeons, although persons of high station had a fancy for treating eye patients. Later, according to a decree given in Paris in 1699, they were not permitted to form a corporation separate from that of the surgeons. Yet the School of Surgeons gave them after an examination the title chirurgien oculiste de Saint Côme; Saint Yves, among others, acquired this title, and these were called by the surgeon to do eye operations at the Hôtel Dieu. Later a place was made here for an "oculiste

en titre," which place existed until Dupuytren's time. Besides this, the oculist of that day had the title "expert oculiste," which disappeared at the time of the revolution.

v. MITTELSTÄDT.

JENSEN (191) had an opportunity of examining a great number of persons between 60 and 80 years of age. Of the 647 persons of either sex examined 81, or 12.5 %, were emmetropic, 492, or 76.3 %, were hyperopic (+ 1. D in 36. %, + 2. D in 22. %, + 3. D in 9. %, + 4. to + 6. D in 8. %), and 55, or 8.5 %, were myopic, 20 being highly myopic. Hyperopia is therefore the usual refractive condition in the aged, and as a rule it is acquired, although we do not know in how far there is a constant increase with age. The higher grades of hyperopia have probably existed since youth.

One hundred persons were examined to determine the astigmatism ; 20 of these had astigmatism against the rule varying from 1.–3. D. The author believes that this astigmatism and the hyperopia are caused by an acquired change in the form of the cornea and sclera. With age the ball gradually alters its form either from shrinking and diminution of tension or from the action of the muscles. Thus the visual axis becomes shortened so that the greatest curvature is at the equator. This process is modified by the functional preponderance of the horizontal muscles so that there is less decrease in the horizontal meridian or an increase in refraction. DALÉN.

GUILLERY (192) calls attention to the fact that good marksmanship is not unusual in persons with poor vision, and he gives the striking example of a sergeant who, with scarcely half the normal acuteness of vision, was the best shot in his troop.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND THERAPEUTICS.

195. LEBER and ADDARIO. Congenital panophthalmitis due to bacilli in a goat, with remarks on fœtal inflammations of the eye and ocular malformations of the eye in general. *Graefe's Archiv*, xlix., 1, p. 362.

196. ADDARIO. On the detection of bichloride of mercury in the aqueous humor after subconjunctival injection. *Ibid.*, 2, p. 375.

197. ADDARIO. Experiments on the entrance of soluble substances into the anterior chamber after injection beneath the conjunctiva. *Ibid.*, 2, p. 362.

198. Lobanoff. On the importance of non-pathogenic micro-organisms in injection of the eye. *Wjest. Ophth.*, 1899, No. 2–3.

199. Faneau de Courmelles. The X-rays in optics and in ophthalmology. *Rec. d'opht.*, 1899, 1, p. 5.

200. Hirschberg. The magnet operation in ophthalmology. Leipsic, 1899, Vest & Co.

201. Snegireff. On vibration massage in ophthalmology. *Inaug. Dissert.*, Moscow, 1899.

202. Parisotti. Considerations on perimetry. A new registering perimeter. *Bull. della R. Accad. di Med. di Roma*, xxv., 1–2.

203. Burnett. Gangrenous ulcerations, affecting the face, including the eyelids of both eyes and destroying both eyeballs—the results of the bite of a man. *Jour. Amer. Med. Assoc.*, June 24, 1899.

204. Johnson. Intraocular hemorrhage subsequent to cataract extraction and iridectomy. *Amer. Jour. of Ophth.*, April, '99.

Leber and Addario (195) found a bilateral panophthalmitis in a new-born goat. There were pronounced changes in the retina and uveal tract, and purulent infiltration with beginning shrinking of the vitreous. These facts indicated that the process had existed before birth. The mother animal was apparently normal, but as other of her young had been unhealthy, it was justifiable to suppose some uterine affection. The purulent infiltration was due to bacilli which were found in great numbers in the vitreous. They appeared to belong to the group of pseudo-diphtheria bacilli. In this case evidently a microbic infection had been communicated by the mother to the fœtus.

Addario (196) found that the percentage of bichloride of mercury in the aqueous humor after subconjunctival injection was very small indeed and the injections, therefore, are of no antiseptic value.

Addario (197) found that solutions of ferrocyanide and iodide of potassium injected beneath the conjunctiva passed by diffusion into the anterior chamber in from five to ten minutes. The maximum percentage in the anterior chamber was reached about an hour after the injection, and the substance could still be detected two or three hours after the injection.

Lobanoff (198) made a number of experiments on rabbits by injecting into the anterior chamber or vitreous cultures of bacillus candidans, violateus, ruber, subtilis, proteus vulgaris, prodigiosus, fluorescens putridus and mesentericus ruber, micrococcus agilis

and roseus, and sarcina lutea. The three first were absolutely non-pathogenic. All the others caused inflammations of varying degree, usually a plastic iritis or iridocyclitis. HIRSCHMANN.

SNEGIREFF'S (201) article on vibrating massage, after an historical sketch and description of instruments and their uses, contains an account of many experiments on animals and clinical observations on the effect of massage on diseases of the anterior segment of the ball. Maklakoff's instrument was used to produce the vibrating massage and his tonometer for measuring tension.

The author's conclusions are as follows : Massage aids the diffusion of solutions from the conjunctival sac into the aqueous, proportionately to the time it is continued. Vibrating massage is more efficient than ordinary massage. Vibrating massage favors the clearing and vascularization of infected corneal wounds and the absorption of blood and pus from the anterior chamber. Intraocular tension is lowered, more materially in glaucomatous eyes than in normal, and repeated massage may keep the tension down for several days. Clinically, massage helps absorption in general, hastening the clearing up of infiltrations and exudations in the conjunctiva, cornea, uveal tract, and anterior chamber.

HIRSCHMANN.

PARISOTTI (202) has constructed a perimeter which in place of the quadrant arc has a straight rod inclined 25°, on which the test object moves. The perimeter is self-registering and the examiner is not in view to distract the patient's attention. The author believes that this instrument has advantages that make the results obtained with it more accurate than those obtained with the older instruments.

BURNETT'S (203) case was a woman of twenty-four years who was severely bitten about the face by her husband in a fit of madness. Extensive sloughing followed, involving the eyelids, the conjunctiva, and both eyeballs, resulting in total symblepharon and adherence of the lids to the orbital walls. No special microbe was found as a cause of the gangrene. BURNETT.

One of the cases reported by JOHNSON (204) was a cataract extraction in a man of seventy-one years, whose eye seemed in perfect condition. The operation was smooth with a small iridectomy, followed by no immediate hemorrhage. Six hours later, after severe pain the contents of the ball with much blood were found on the dressing. The other case was an iridectomy for glaucoma, with only slight bleeding from the iris, and a slight

tendency of the wound to gap. Four days afterwards there was much pain, and when the dressing was removed the contents of the globe were found on it. BURNETT.

III.—INSTRUMENTS AND REMEDIES.

205. PRAUN. On the use of protargol in ophthalmology. *Centralbl. f. prakt. Augenheilk.*, xxiii., pp. 129 and 170.

206. GIDSCHEN. Protargol in eye diseases. *Wojenno med. Journ.*, 1899, No. 3.

207. SNEGIREFF. On the use of protargol in ophthalmology. *Med. Obosren.*, 1899, No 5.

208. HIRSCHBERG. On the question of holocaine. *Centralbl. f. prakt. Augenheilk.*, xxiii., p. 181.

209. WOLFFBERG. The formalin-bolus paste. *Wochenschr. f. Ther. u. Hyg. der Auges*, 1899, No. 33.

210. THORNER, WALTHER. A new stationary ophthalmoscope giving an image free from reflexes. *Zeitschr. f. Psych. u. Physiol. der Sinnesorgane*, xx., p. 294. (Preliminary communication. An excellent instrument, exhibited at the International Ophthalmological Congress at Utrecht.—H. K.)

211. CZAPSKI. A binocular corneal microscope. *Graefe's Archiv*, xlix., 1, p. 229.

212. TRIEPEL. Further reports on the decentration of bispherical lenses. *Ibid.*, 2, p. 432.

213. HOWE. On a compound microscope for viewing the eye. *N. Y. Med. Journ.*, June 17, 1899.

214. GUTTMANN. Holocaine as a local anæsthetic. *Ibid.*, June 27, 1899.

215. TIFFANY. Electric dry heat in ulceration of the cornea. *West. Med. Journ.*, Apr., 1899.

216. COOVER. The use of egg membrane in ophthalmic surgery. *Ophth. Record*, May, 1899.

217. STILLSON. Some experiments with the great magnet. *Ibid.*, March, 1899.

PRAUN (205) uses protargol 1 : 10 for fomentations, instillations, salves, and for irrigating the lachrymal passages. He obtains good results in the various forms of conjunctivitis and keratitis.

GIDSCHEN (206) found protargol solutions less irritating and quicker in action than solutions of nitrate of silver. Even trachoma and pannus are cured by its use. HIRSCHMANN.

According to SNEGIREFF (207) protargol has no advantages over nitrate of silver. The signs of irritation are even more marked than after the use of silver. HIRSCHMANN.

According to HIRSCHBERG (208) holocaine is preferable to cocaine. Its action is more intense in iridectomy, strabismus operations, and cauterization of corneal ulcers.

HOWE (213) describes a compound microscope mounted so as to make an examination of the anterior parts of the eyeball—a kerato-iridoscope. The objective has two systems, separated from each other by 8 *cm.* The focus of the two systems is 12 *cm*, and has an angular aperture of 35°. Suitable eye-pieces are placed at the other end of the tube in which they are mounted. This tube, which is 28 centimetres long, is mounted on a suitable stand, with rack and pinion adjustment for focussing. The amplification is from 50 to 125 diameters. BURNETT.

As between cocaine and holocaine, GUTTMANN (214) finds the latter preferable in strabismus operations, removal of foreign bodies, and inflammatory states of the conjunctiva and cornea. Cocaine is preferable when an iridectomy is to be made.

BURNETT.

TIFFANY (215) has devised a pad of felt, with a coil inside, through which an electric current can be run, giving any desired amount of constant and continuous heat. He has found this very useful in the various forms of corneal ulcerations.

BURNETT.

COOVER (216) has used the inner membrane of the egg as a covering for denuded surfaces on the eyeball, ulceration of the cornea, and incised wounds, with much satisfaction.

BURNETT.

As a result of some experimenting with the large magnet of Haab, STILLSON (217) has formulated a number of aphorisms, from which we extract the following as of most interest: Usually the best line of force to use is the line that radiates from the tip of the magnet. The management of the foreign body will depend more upon its shape than is generally believed. If the body is disc-like, it should be made to saw its way with the edge forward; if it be pyramidal, the point should be extracted first. It is a mistake to place the patient at a distance and cause him to

approach the magnet gradually. Small pieces that are behind the iris are difficult to remove by means of the large magnet. For these an iridectomy, with or without a Hirschberg magnet, is the best. Large pieces may be made to perforate the iris or conjunctiva if they have a suitable shape and are properly managed. Where large pieces have entered through the sclera without injury to the lens, it is best to make a hole nearest the point where they lie and extract through this. The large magnet should not be used for diagnostic purposes on account of the harm it may do to the tissues by laceration. BURNETT.

Sections IV.–VII. Reviewed by DR. ST. BERNHEIMER, Vienna.

IV.—ANATOMY.

218. TERRIEN. The mode of insertion of the zonula fibres on the lens and the relation of these fibres to one another. *Arch. d'opht.*, xix., April, 1899.

219. ISCHREYT. Anatomical and physical investigations on the sclera of the ox. *Graefe's Archiv*, xlviii., 2, p. 384.

According to TERRIEN'S (218) investigations, the zonula fibres running to the lens form two groups. The first consists of fibres which run to the anterior and posterior capsule of the lens, and a short distance from it break up into fine elementary fibres, each of which passes to the capsule, rests upon it for a short distance, and then gradually becomes incorporated into it.

The fibres inserted into the anterior capsule lie in the capsule for a farther distance than those inserted into the posterior capsule. The second group consists of fibres running to the equator, which are more delicate, but at times spread out fan-shaped or in irregular shapes, and have transverse connecting fibres. Just before reaching the equator of the lens they break up into elementary fibres, each of which has a punctate insertion into the capsule. The terminations of the zonula fibres on the capsule of the lens are like their origins in the lamina vitrea of the choroid; at both places the fibres are very fine. The anterior and posterior fibres serve the purpose of accommodation, while the intermediary merely maintains the position of the lens.

V. MITTELSTÄDT.

ISCHREYT (219) characterizes the sclera as a complicated organ.

Microscopic examination reveals a systematic arrangement of fibre bundles. In the posterior segment the bundles run for the most part obliquely, crossing one another at right angles like the cords in the network of a balloon. In the region of the retractor muscle, superficial ring bundles are found, between which the prolongations of the tendons enter in a meridional direction. The same is the case where the recti muscles are inserted. The tendons branch and broaden out, and are inserted among the ring bundles. A ridge of firmer ring bundles lies external to this zone, and completes the anchoring of the muscle tendons. At the limbus the tissue, which is elsewhere fairly simple in structure, forms a confused network.

The physical studies are in reference to the extensibility and strength of different portions of the sclera, the relations differing greatly in different parts. If there is in the sclera an elastic compensating arrangement to suit different tensions, this exists only in its posterior portion.

V.—PHYSIOLOGY.

220. UHTHOFF. A contribution to congenital total color-blindness. *Zeitsch. f. Psych. u. Phys. d. Sinnesorg.*, XX., 4–5, p. 326.

221. ZEHENDER. The form of the vault of the heavens and the apparently greater size of the stars near the horizon. *Ibid.*, p. 353.

222. ASHER. Monocular and binocular field of fixation of an emmetrope. *Graefe's Archiv*, xlviii., 2.

223. WELLS. Keratometry and astigmatism. *Homeopathic Eye, Ear, and Throat Journal*, April, 1899.

UHTHOFF (220) presents an accurate and valuable study of a patient who was congenitally totally color-blind, in which the observations of earlier writers are confirmed and undecided questions are made clearer.

Uhthoff found, as did Koenig in his case, that there was a central scotoma, 1.5° in diameter, which would indicate an absence or a functional disturbance of the cones in the macula. The peculiar nystagmus showed that there was not a circumscribed spot of distinct vision at the macula, and the patient in steady fixation used first one and then another portion of the equally functionating macula. In the spectrum the achromatic

patient found the red end markedly shortened, the violet end not. The brightest point in the spectrum lay in the green at about 530 μ.

The results of comparative examinations of the achromatic and the normal eye agreed with Hering's ideas as to the white and color values of the colors.

In examining 837 eyes, by means of Javal's instrument, WELLS (223) finds that the findings of Javal and the findings with the test lenses agree in 31 %, varied 0.25 D in 35 %, varied .50 D in 19 %, and 0.75 D in 13 %. One hundred eyes, under a mydriatic, give a much closer approximation. BURNETT.

VI.—REFRACTION AND ACCOMMODATION.

224. SZILI. On the question of the operation for myopia with demonstration of patients. *Ung. med. Presse*, 1899, No. 10.

225. MOHR. An operated case of myopia. Bericht. ü. d. Sitzung d. Budapester Aerztevereins. *Ung. med. Presse*, 1899, No. 10.

226. HERTEL. A contribution to the question of myopia operations. *Graefe's Archiv*, xlviii., 2.

227. SCHMIDT-RIMPLER. The operative treatment of myopia of high degree and its indications. *Therapie der Gegenwart*, i., 4.

228. WÜRDEMANN. The surgical treatment of high myopia. *Annals of Ophth.*, April, 1899.

SZILI (224) and MOHR (225) oppose the practice of operating on both eyes in myopia, since we have not yet sufficient experience as to the final outcome. It is to be remembered, further, that after the operation near vision with the correcting glass is never so good as the near vision was before the operation and thus the patient has the disadvantage of poorer near vision to overbalance the advantage of improved vision in the distance.

HERRNHEISER.

In 8 of the 24 patients operated on for myopia in the Jena clinic, HERTEL (226) saw opacities appear in the pupil at various intervals after the complete absorption of the lens.

In 6 cases there were tough secondary cataracts which must be taken into account in formulating the final prognosis, since in dividing these the vitreous must be incised, which is not an innocent matter in myopic eyes.

In 2 cases, however, the opacities were due to changes in the anterior portion of the vitreous.

No cause can be assigned for these changes in the vitreous, but they must not be disregarded. This is another reason for not operating on both eyes.

SCHMIDT-RIMPLER (227) discusses the advantages and disadvantages of the myopia operation. He considers the operation an important advance in the therapy of myopia, but it is to be employed only under restricted indications and with the necessary precautions. The operation does not check the pathological changes in the eye due to the myopia, it is not without danger, and its only purpose is to improve distant vision in selected cases.

In addition to a history of the surgical treatment of high myopia WURDEMANN (228) gives a case of his own in a woman of twenty whose refraction was R $-$ 17 ⊃ $-$2.75 180°. L $-$ 16 ⊃ $-$ 1.50 180°. V = $\frac{6}{36}$ $-$ after absorption of the lenses. R + 1 ⊃ + 2 115° V = $\frac{6}{24}$. L + 2 ⊃ + 3 75° V = $\frac{6}{24}$. BURNETT.

VII.—MUSCLES AND NERVES.

229. AUERBACH. On the curvature of the anterior surface of the cornea. *Medic. Obosrenji.*, 1898, xii.

230. AUERBACH. Changes in corneal astigmatism due to operations on the recti muscles. *Ibid.*, v.

231. REDDINGIUS. On the nature of squint and the indications for operative interference. Gravenhagen, 1899.

232. DU BOIS-RÉYMOND and SILEX. On cortical excitation of the ocular muscles. *Arch. f. Anat. u. Phys., Phys. Abth.*, 1899, p. 174.

233. SACHS. On alternating squint. *Graefe's Archiv*, xlviii., 2.

234. BERNHEIMER. Remarks on Bach's paper "On paralysis of the ocular muscles" etc. *Ibid.*, 2 and 3.

235. SCHWEIGGER. On the technique of advancement for squint. *Arch. f. Augenheilk.*, xxxix., 2, translated in these ARCHIVES, 1899, No 4.

236. DUANE. Divergent strabismus cured by correction of myopia. *Ophth. Record*, April, 1899.

237. STEVENS. Historical notes on strabismus and other anomalies of the eye muscles. *Annals of Ophth.*, April, 1899.

238. Posey. A clinical study of 287 cases of hyperphoria. *Philada. Med. Journ.*, April 8, 1899.

239. Roosa. The Panas operation for strabismus. *The Post-Graduate*, March, 1899.

Auerbach's (230) examinations with the Javal-Schiötz ophthalmometer showed that there is a gradual increase in radius of curvature from the centre of the cornea toward the periphery. This increase is not uniform, but becomes greater toward the periphery. The flattening of the cornea is more pronounced in the medial half than in the lateral. In order to determine whether this peculiarity is not due to the traction of the ocular muscles, Auerbach examined seventeen eyes, both before and after squint operations. After tenotomy of the internal rectus, the corneal astigmatism increased from 1. to 1.2 D. The increase in curvature was constantly in the vertical meridian. Tenotomy of the external rectus gave the same result, but less constantly. Tenotomy with advancement of the antagonist caused a decrease in refraction in both meridians. Hirschmann.

Sachs (233) reports on a number of experiments made with the purpose of learning the conditions under which alternation of squint takes place, dividing all cases into four categories.

Bernheimer (234) refutes Bach's objections to his ideas as to the localization of the nuclei for the intrinsic muscles of the eye, and offers a new experimental proof of the correctness of his views. If the upper portions of the corpora quadrigemina are removed from a narcotized monkey, and the region of the oculomotor nucleus divided by a smooth section through the middle, excitation of the nuclear region will cause isolated movements of the eye of the same side and contraction of its pupil. This pupillary contraction only occurs when the electrode is passed beneath the aquæduct in the anterior third of the anterior corpus quadrigeminum. This is exactly the location of the small-celled medial nucleus in the monkey and in man. From no other spot can pupillary contraction be obtained with a current of the same strength.

In the case reported by Duane (236) there was M of 6 D in R, 11 D in L, with a strab. divergens of two or three lines. A constant nearing of correcting glasses, and an exercise of the left eye, caused a disappearance of the strabismus during their use. It reappeared if the glasses were left off. Burnett.

Stevens (237) in this interesting paper describes the progress

made in the methods of investigating deviation of the eyes and anomalies of ocular muscles and their treatment, from the time of Ambroise Paré to our own period, in which he himself has played such an important part in the development of the subject in all its relations. BURNETT.

According to the statistics of POSEY (238) hyperphoria of 1° or more exists in about 13% ot all cases of refraction. It may or may not exist with lateral heterophoria. It may or may not be associated with ametropia. It is present in all cases of anisometropia when the difference between the two eyes is at all marked. It is always present in both convergent and divergent strabismus. It is frequently latent—correction of the associated ametropia is not sufficient in the majority of cases to subdue the hyperphoria. As to treatment he tenotomizes only after prisms have failed to give relief. BURNETT.

ROOSA (239) reports four cases of strabismus, three internal, one external—treated by Panas's method of stretching the muscle before the tendon is divided. The results in all cases but one were satisfactory. BURNETT.

Sections VIII.–XII. Reviewed by DR. R. SCHWEIGGER.

VIII.—LIDS.

240. KUGEL. On an operative procedure for the relief of thickening of the lids after ulcerous blepharitis. *Graefe's Archiv*, xlviii., 2, p. 459.

241. WESTHOFF. Distichiasis congenita hereditaria. *Med. Weekblad*, May 13, 1899.

242. HIRSCHBERG. "Penelope," an unusual lid operation. *Deutsche med. Wochenschr.*, 1899, No. 26, p. 418.

243. ABADIE. The nature and treatment of zona. *Arch. d'opht.*, xix., No. 5, p. 306.

244. VAN DUYSE. Elephantiasic cavernous lymphangioma of the lid in a new-born infant. *Arch. d'opht.*, xix., 5, p. 273 (with illustrations).

245. GOTTI. On the treatment of ectropium by cauterizing the conjunctiva. *Bull. delle Scienze Med. di Bologna*, March, 1899.

246. JÆSCHE. Remarks on lid operations. *St. Petersburg med. Wochenschr.*, 1899, No. 14.

247. KOSTER. A new ptosis operation. *Zeitschr. f. Augenheilk.*, 1899, i., 6, p. 543.

248. OLIVER. Brief report of a case of fibroma of the eyelid (painful subcutaneous tubercle of Wood). *Ophth. Record*, June, 1899.

KUGEL (240), in a patient aged eight, with thickening of the lid and recurrent ulceration, relieved the thickening and the tendency to ulceration by removing several lamellæ from the tarsus by splitting the lid.

WESTHOFF'S (241) patient, a girl of eight, had photophobia. The cilia were normal on each side, the lid margins were normal, and there was no trace of blepharitis. On the sharp inner margins of both the upper and lower lids could be seen a great number of fairly long normal hairs. On the upper lids these were at least fifteen in number. The conjunctiva was red from the irritation, but there was no sign of trachoma. After epilation the photophobia passed off and the eye was no longer red. Electrolytic epilation was then employed.

The mother of the child had had from birth lashes that turned in, as had also a brother of the patient and several other relatives. True distichiasis (a double row of cilia) is rare, and hereditary cases have not been described.

In a patient operated on for entropium according to the Spencer-Watson method, a strip of skin being implanted between the lashes and the free margin of the lid, HIRSCHBERG (242), on account of the disfigurement and the presence of irritating fine hairs, returned the cilia to their old location and covered the intermarginal space with mucosa from the lip.

According to ABADIE (243) herpes zoster ophthalmicus is in no sense an affection of the first branch of the fifth nerve, but an affection of the vasomotor nerves. This is indicated by the fact that the skin eruption does not correspond to the course of the nerves, but to that of the vessels which follow the nerves for a short distance and then leave them. If an intracranial inflammation affects the trigeminus or the Gasserian ganglion, the sympathetic fibres of the carotid plexus arising from the superior cervical ganglion would also be involved. The sensory disturbances are thus brought about by the trigeminus, while the vasomotors cause a dilatation of the vessels and the inflammatory changes in the skin which in their distribution follow exactly the branches of the ophthalmic artery. The lack of cutaneous

disturbance on the upper and lower jaws is explained by the fact that the vasomotors of this region do not run in the carotid plexus. A further proof of his views is found by the author in the fact that in herpes zoster of the thorax the upper three intercostal spaces remain unaffected because their arteries (arising from the subclavian) and vasomotor nerves have a different origin from the other intercostal arteries, which arise from the aorta. Abadie's explanation makes comprehensible the severe brain symptoms which sometimes occur with zona (hemiplegia from rupture of dilated vessels). In the way of treatment Abadie recommends quinine, which contracts vessels.

v. MITTELSTÄDT.

After a short résumé of the new observations in the literature, VAN DUYSE (244) describes a congenital lymphangioma in an infant three weeks old. The hemispherical elastic tumor which was situated in the left upper lid was one of the largest that has been seen. It occupied the greater portion of the left frontal region, covered a portion of the cheek, extended inwardly beyond the middle line of the nose and outwardly to the external margin of the orbit. The skin, which was not movable above it, was smooth and unchanged, as was also the conjunctiva both palpebral and bulbar. After the death of the infant from gastro-enteritis the tumor was about one third smaller than before. When incised a clear yellow serum escaped from the spongy tissue making up the bulk of the tumor, in which were many cysts as large as a cherry. The supporting tissue of the tumor, which was in intimate connection with the skin of the lid, the tarso-orbital fascia, and the periosteum of the frontal bone, consisted of fibrillæ and elastic fibres. The lymph spaces were lined with a single layer of endothelium and were partly filled with red blood corpuscles. One cyst was filled with blood, indicating a communication between lymph- and blood-vessels. v. MITTELSTÄDT.

GOTTI (245) reports a case of extensive ectropium with great thickening and swelling of the conjunctiva which was cured by cauterization with the thermo-cautery. KRAHNSTÖVER.

KOSTER (247) improved the old Pagenstecher method, which did very well before asepsis was introduced, by passing the sutures from the lid margin to the forehead entirely beneath the skin and allowing them to remain. They were passed out divergent above and tied so tightly that at the time of operation the patient could barely close the lids.

OLIVER (248) describes and figures a case of small fibroma of the eyelid accompanying the appearance of these painful subcutaneous tubercles (Wood) on other parts of the body. On section these nodules show curvilinear circumscribed bundles of densely packed fibrous tissue containing many blood-vessels.

BURNETT.

IX.—LACHRYMAL APPARATUS.

249. HERTEL. A contribution to the pathological anatomy of disease of the lachrymal sac. *Arch. f. Ophth.*, xlix., p. 21.

250. RICCHI. Bacteriological researches and brief clinical considerations on some cases of lachrymal tumor. *Ann. di Ottalm.*, xxviii., p. 17.

251. BETTREMIEUX. A second contribution to the study of neuralgias and tics of the face considered in their relation to a pathological state of the lachrymal passages. *Arch. d'opht.*, xix., 4, p. 246.

According to HERTEL (249) the diseases of the tear sac appear under the same pathological pictures as the diseases of other tubes of mucous membrane, for example, the chronic suppuration with degeneration of the epithelium, accumulation of goblet and lymph cells, infiltration with round cells, loss of epithelium and basal membrane, and stricture. In the normal mucous membrane of the tear sac and in the neighboring nasal portion Hertel found lymph cells in a particular arrangement, but glands were wanting. In tear sacs that had been vigorously treated the degeneration was clearly to be seen.

BETTREMIEUX (251) is convinced that neuralgias and spasms of the face may arise from an irritation of the trigeminus fibres running in the mucosa of the nasal duct. These affections may be brought about by even very slight changes in the mucosa, such as might be caused by a small bony projection which was not large enough to block the canal which is always found to be patulous. Nevertheless probing had an excellent result in a previous case and in two later cases, in one a neuralgia of the trigeminus being entirely cured and in the other a facial spasm being very much improved. The author adds an old observation by Philippart, who found that after the introduction of Dupuytren's permanent sounds into the nasal duct the epiphora ceased, but a tic douloureux was induced which passed off only when the sound was removed.

v. MITTELSTÄDT.

X.—ORBIT.

252. GROENOUW. Shot wound of the orbit with determination of the presence of the bullet by means of the Roentgen rays. *Klin. Monatsbl. f. Augenheilk.*, xxxvii., May, 1899.

253. AHLSTRÖM. Extirpation of a retrobulbar tumor with preservation of the eyeball. Osteoplastic resection of the temporal margin of the orbit. *Hygieia*, May, 1899.

254. SCHMEICHLER. On protrusion of the ball. *Wiener med. Wochenschr.*, 1899, No. 8 *et seq.*

255. DE SCHWEINITZ. Fistula of the orbit due to disease of the lachrymal division of the ethmoidal cells. Operation and cure. *Ophth. Record*, June, 1899.

256. GIFFORD. Pulsating exophthalmus from aneurismal varix in the neck. *Ibid.*, April, 1899.

257. DENIG. Varicose veins in the orbit. *Ibid.*, May, 1899.

258. HOTZ. Mucocele of the ethmoidal cells simulating an orbital tumor. *Jour. Amer. Med. Assoc.*, April 1, 1899.

GROENOUW (252) discovered by means of the Roentgen rays the seat of a 6 *mm* bullet in the orbit. For orientation in the skiagraphs he passed one wire about the head horizontally and another vertically, and indicated the bridge of the nose by a shot fastened to the skin with plaster. In one of his patients the eyeball had been grazed, causing some diminution of vision; in the other one eye was blind from a rupture of the choroid, and the second from injury of the nerve.

AHLSTRÖM (253) in one case employed the Krönlein method with good results.

In SCHMEICHLER'S (254) five cases of exophthalmus a syphilitic neoplasm was the probable cause of one, an angioma in another, while in three cases there was probably merely an innocent abnormality in the structure and contents of the orbit.

The case reported by DE SCHWEINITZ (255) was that of a young woman of nineteen, who had suffered from a discharge from the inner angle of the orbit for five years and had been treated for lachrymal trouble without cure. De Schweinitz found a fistula running back into the ethmoid which he opened up, curetted, and drained through the nose by means of a fenestrated tube in the manner suggested by Gruening. There was also some caries of the nasal bones which was treated by Dr. Freeman. The case healed without any deformity. BURNETT.

GIFFORD'S (256) case is a man who after a severe blow on the neck, which was followed by an immediate large swelling, experienced an exophthalmus of the left eye and a paralysis of the left externus. There is no evidence that the aneurism has invaded the orbit. Gifford thinks the exophthalmus and the paralysis of the external rectus due to increased pressure on the cranial sinuses caused by the aneurism of the neck, the pressure being transmitted through the petrosal sinuses to the cavernous sinus. The trouble has existed four years. BURNETT.

In the case recorded by DENIG (257) the tumor of varicose veins was situated near the top of the ball and could be easily palpated. There was a slight enophthalmus when the patient was in the erect posture, also some ptosis, but no paralysis of any muscle. Fundus normal. There were also some small varices of the under lip, and the patient suffered from hemorrhoids, and had varix of the leg. No treatment is given. BURNETT.

The case described in HOTZ'S (258) paper was a girl of thirteen who had had a fracture of the root of the nose and afterwards suffered with nasal catarrh. For a year past the left eye was noticed to bulge and the skin of the upper lid was at times red and painful. The movements of the ball were good and there was no diplopia. The fundus was normal. The tumor was situated on the inner wall of the orbit and felt smooth until it reached a little below the palpebral ligament, where a ragged edge of bone was felt. An incision let out about four ounces of creamy emulsion. The ethmoid was scraped out, and drainage was made through the nose by breaking down the lower wall of the ethmoid. In four weeks there was complete healing. BURNETT.

XI.—CONJUNCTIVA.

259. SCHMIDT-RIMPLER. Pseudo-trachoma caused by the hairs of plants. *Deutsche med. Wochenschr.*, 1899, Nos. 25, 26.

260. FEUER. My present method of treating trachoma. *Centralbl. f. prakt. Augenheilk.*, xxiii., April-May.

261. EWETZKI. Crescentic lipodermoid tumors of the bulbar conjunctiva. *Med. Obosrenie*, 1899, Jan.

262. KUHNT. A modification of the method of using the expressor in trachoma. *Zeitschr. f. Augenheilk.*, i., 4, p. 259.

263. DUANE. Angio-neurotic œdema of the conjunctiva. *Ophth. Record*, viii., 4, p. 178.

264. SNYDACKER. Trachoma toxins and antitoxins. *Journ. Amer. Med. Assoc.*, May 6, 1899.

265. ELLETT. A case of chancre of the conjunctiva. *Ophth. Record*, June, 1899.

266. WOODS. A case of intra-uterine gonorrhœal ophthalmia with loss of both eyes. *Journ. of Eye, Ear, and Throat Diseases*, 1899, Jan.

267. BELL. Diphtheritic conjunctivitis cured with antitoxin. *Med. Record*, June 10, 1899.

268. PINCKARD. Diphtheritic conjunctivitis. A case treated with injections of antitoxin; recovery without danger to the eye. *Journ. Amer. Med. Assoc.*, May 27, 1899.

SCHMIDT-RIMPLER (259) describes a case of nodule formation in the conjunctiva, similar to trachoma, caused by little light-colored hairs of plants which projected from the follicles and papillæ and in part could be removed with forceps.

FEUER (260) describes the treatment of trachoma that is quasi-official in Hungary. The remedies with which he cures his patient in from three to six months are nitrate of silver 2 %, which is employed against the inflammatory symptoms, and bichloride solution 1 %, which is rubbed into the conjunctiva with a hard pledget of cotton, each being used on alternate days. Soft nodules are expressed between the finger nails or rarely with an epilator. Cocaine anæsthesia is not sufficient. The mitigated silver stick is used when there is progressive pannus, and boric acid powder is used to clear up pannus. The excision of the retrotarsal folds and tarsus which he has seen practised in Eastern Prussia he finds seldom necessary. However, he does partial excision of the tarsus when its enlargement has caused ptosis, and when its curvature has produced entropium.

EWETZKY (261) describes five cases in which a crescentic tumor lay to the outer side of the cornea extending above and below into the fornices and laterally back into the orbit. In some cases hairs grew from the surface. Examination revealed an epithelial structure superficially, a dermal layer deeper, and finally fatty tissue which seemed to be continuous with the orbital fat. Ewetzky considers these tumors sufficiently typical to be classed as a special group under the name "crescentic lipodermoid of the conjunctiva." Their development probably begins in fœtal life.

HIRSCHMANN.

KUHNT (262) in trachoma uses an expressor with curved branches, without ectropionizing the lid, taking the entire lid between the branches under cocaine anæsthesia. He avoids everting the lid because if the mucosa is densely infiltrated it will be ruptured, and if the retrotarsal fold has been excised, eversion is impossible.

264. Some time ago (February, 1899) SNYDACKER described a diplococcus which he deemed specific to trachoma. He has now made cultures and obtained a toxin with which he has been experimenting. He claims to have demonstrated the effects of these toxins on animals "to whose action doubtless are due those disastrous local effects with which oculists are so familiar." The antitoxin he has made he thinks will be beneficial in the early stages of the disease. BURNETT.

ELLETT'S (265) case was a young man of twenty-four. There was an ulcer with elevated edges and a firm unyielding base on the conjunctiva of the right upper lid at the outer part. The pre-auricular gland on that side was swollen. The case was watched, without any treatment but cleanliness, and at the end of four weeks a typical roseola appeared on the body. Patient claims there was no other chance of infection aside from washing in the lavatories of hotels. BURNETT.

In the case recorded by WOODS (266) a child at the time of delivery had redness and swelling of the lids, and there were already opacities of the corneas of both eyes. On the day of birth both eyes began to matter freely with the typical appearance of oph. neonatorum. The vaginal discharge of the mother showed large numbers of gonococci. Both eyes were lost.

BURNETT.

BELL'S (267) patient was a child of two years who had a membranous conjunctivitis which showed the presence of the Klebs-Loeffler bacillus. There was a temperature of 101.8°. After two injections of serum two days apart, and irrigation with 1 to 5000 bichloride solution, the disease practically subsided.

BURNETT.

The case treated by PINCKARD (268) was a man of twenty-three, who had a membranous conjunctivitis with the typical clinical and bacteriological pictures of the diphtheritic form. He had no other treatment than injections of antitoxin and cleanliness of the eye. The membrane did not begin to slough until about the

fourth day of the disease and after three injections of antitoxin had been administered of from 2000 to 4000 units.

BURNETT.

XII.—CORNEA, SCLERA, AND ANTERIOR CHAMBER.

269. LANGIE. A contribution to the etiology of parenchymatous keratitis. *Przeglad lekarski*, 1898, 22.

270. DIEZ. Contributions to the etiology of parenchymatous keratitis. *Zeitschr. f. Augenheilk.*, 1899, i., 5, p. 435.

271. GRÓSZ. Neuroparalytic keratitis. *Ungarishe Beiträge z. Augenheilk.*, ii.

272. LAGRANGE. Primary tumors of the cornea. *Arch. d'opht.*, xix., p. 209, April.

273. MAJOWSKI. On the correction obtained with Lohnstein's hydrodiascope in cases of keratoconus and irregular astigmatism. *Klin. Monatsbl. f. Augenheilk.*, 1899, May.

274. BIRCH-HIRSCHFELD. A contribution to the knowledge of degenerative processes in corneal scars. *Graefe's Archiv*, xlviii., 2, p. 328.

275. SCHAUTE. A case of rupture of the cornea and perforation of the iris without injury of the lens. *Zeitschr. f. Augenheilk.*, i., 4, p. 374.

276. ANDOGSKY. On Kalt's corneal suture. *Wjest. Ophth.*, 1899, iii.

277. HARLAN. Abscission and combined keratectomy. *Ophth. Record*, June, 1899.

278. JENNINGS. Persistent pannus cured as a result of acute dacryocystitis. *Amer. Jour. of Ophth.*, May, 1899.

LANGIE'S (269) case of parenchymatous keratitis, in a woman aged twenty-one, recovered after the extraction of a carious wisdom tooth. Syphilis could be excluded. HERRNHEISER.

GRÓSZ (271) comes to the following conclusions:

1. The suppurative keratitis which affects the eyes of animals after section of the trigeminus, and the human eye after injury, compression, disease, or resection of the nerve, and also accompanies facial paralysis, is a single disease and is due to infection. The source of this infection is the conjunctival sac or the lachrymal sac, or there may be a direct external infection from contact.

The development of the disease is favored by the desiccation and the slight protection against trauma due to the anæsthesia.

2. The cause of true neuroparalytic keratitis in man and of keratomalacia and keratonecrosis is a degeneration of the ganglion cells in the ciliary ganglion. This is due to cachexia, local hemorrhage, or to injury.

LAGRANGE (272) regards as true neoplasms of the cornea only those that arise from the cornea proper or its epithelium. Of the former, which are described as myxoma, fibroma, or sarcoma, there is a series of old doubtful cases which Lagrange considers, as well as the newer observations which are more reliable. His own case was one of papilloma or epithelioma, occurring in a man of seventy, with a carcinoma of the lip, as a cauliflower-like tumor completely covering the cornea, but not involving the limbus or the surrounding conjunctiva. At the base of the tumor, where Bowman's membrane was destroyed, numerous vessels passed into the papillary proliferations. v. MITTELSTÄDT.

MAJOWSKI (273) gives in tabular form the results obtained by using Lohnstein's hydrodiascope for the improvement of vision in twenty-one eyes. The instrument is made plane anteriorly instead of being + 33. D, and he has used plano-convex lenses from 20–40. D on account of the greater optical accuracy.

BIRCH-HIRSCHFELD (274) compares the statements that have been made in regard to hyalin, colloid, and amyloid, and gives the results of his study of these substances in the eye and in other organs. The colloid in corneal scars in his opinion is identical with hyalin and arises from the blood (by coagulation of a liquid), being deposited first in the corneal substance or scar and later among the epithelial cells.

SCHAUTE'S (275) patient was struck in the eye with a piece of wood, causing a small perforation of the cornea and a radial rupture of the iris with preservation of the sphincter and without injury to the deeper parts.

ANDOGSKY (276) believes Kalt's corneal suture to be the best of all those that have been recommended. He modifies it by adding a second suture. He believes, however, that a suture is indicated in exceptional cases only, when, for example, one expects prolapse of vitreous or when the wound gapes. He recommends it also in flap extraction when one wishes to preserve a round pupil. It is also of service in excising old prolapses after extraction, in removing portions of the cornea for the

correction of keratoconus and keratoglobus, in operations for corneal or scleral staphyloma, and in operations on animals.

HIRSCHMANN.

In this paper (277) HARLAN makes a plea for a return to the method of corneal abscission which was advocated by Critchett some twenty-five years ago. The stump, better than an enucleation leaves, and the comparative safety under our present antiseptic methods are advantages which cannot be ignored. Panas has also revived the operation. The reviewer has always made this operation in the case of children when possible, and particularly when an artificial eye cannot be worn for some time.

BURNETT.

In the case reported by JENNINGS (278) a trachomatous pannus which had resisted all manner of treatment, including jequirity, disappeared during an attack of dacrocystitis. BURNETT.

Sections XIII.–XVIII. Reviewed by DR. O. BRECHT, BERLIN.

XIII.—LENS.

279. DAGILAISKY. A case of spontaneous absorption of a senile cataract. *Zehender's klin. Monatsbl.*, xxxvii., p. 218.

280. HESS. On fœtal rupture of the posterior capsule of the lens and lenticonus posterior. *Zeitschr. f. Augenheilk.*, 1, p. 427.

281. DALBEAU. On suture of the cornea for preventing certain accidents occurring after extraction of cataract. *Arch. f. Ophth.*, xix., 6, p. 352.

282. IGNATIEFF. On cataract extraction without iridectomy. *Wojenno med. Fourn.*, 1899, 1.

283. RANDOLPH. Diabetic cataract with a report of five operations. *Ophth. Record*, April, 1899.

284. DENIG. On the histology and etiology of posterior lenticonus. *Ibid.*

285. RAY. Some of the failures immediate and remote met with after cataract extraction. *Amer. Fourn. of Ophth.*, June, 1899, and *Annals of Ophth.*, April, 1899.

DAGILAISKY'S (279) patient was a peasant woman who gradually grew blind, and then gradually obtained vision again without any assignable cause. The eye showed no trace of injury. Behind the iris was a delicate secondary cataract and a shrunken brown

nucleus. Fundus normal. With + 10. D V = < 0.5. [Absorption of the liquid of a Morgagnian cataract.—H. K.]

Hess (280) described a peculiar malformation of the lens seen in a pig's eye, which arose from a fœtal rupture of the capsule; and two pigs' eyes with the nucleus of the lens lying excentrically down and out so that a lenticonus posterior was brought about. The latter malformation also is attributed by the author to a fœtal rupture of the posterior capsule leading only to local changes in the fibres, as appeared from Schlösser's investigations. All three eyes contained remnants of the hyaloid artery.

Dalbeau (281) reports two cases from Trousseau's practice which show the value of corneal suture after extraction. In the first case the corneal flap became everted four days after the operation and the iris prolapsed, and here the suture led to good results. In the second case the patient, being delirious the third night after the operation, struck the eye, causing pain and hemorrhage, which were only relieved when a suture was applied two days later, at which time clots of blood and iris were removed from the wound. The threads which were passed through the conjunctiva had cut through in two days, and the hemorrhage recurred and was stopped only when another suture was passed deep into the sclera, which is always necessary in cases of severe hemorrhage. The cornea became infiltrated in the region of the wound, but a moderately atrophic eyeball was preserved.

v. Mittelstädt.

Randolph (283) gives the results of three cases (five eyes) of diabetic cataract on which he operated with success. The patients were, respectively, 35, 35, and 45 years old, and the combined operation was done. Burnett.

Denig (284) describes and figures a lenticonus observed in the lens of a rabbit, which had at the same time a total anterior polar cataract. He divides posterior lenticonus into two forms, those with, and those without, rupture of the posterior capsule. To the former alone would be given the name of lenticonus; to the latter he thinks lentiglobus more proper. The hyaloid artery, he thinks, plays no important part in their production. The equatorial diameter of the lens was 8 *mm*, the sagittal 4 *mm*. The degenerated nucleus was surrounded by normal lens fibres, except the central posterior part where the lenticonus rested directly on the degenerated fibres. Burnett.

The basis of Ray's (285) report is 141 extractions, 36 of which

were simple. Many of the operations were done under unfavorable conditions. There were 3 failures from corneal suppuration, 1 from hemorrhage from the iris, 2 from suppurative irido-choroiditis starting from a prolapsed iris, and 2 from secondary operations. These latter were not simple capsulotomies, but for closure of the pupil from inflammation. BURNETT.

XIV.—IRIS.

286. WINGENROTH. A case of diplocoria of the right eye. *Centralbl. f. pr. Augenheilk.*, xxiii., p. 105.

287. HANKE. Gumma of the iris and ciliary body. *Graefe's Archiv*, xlviii., p. 300.

288. SCHLIPP. On an epithelial tumor of the ciliary body. *Ibid.*, p. 353.

289. BRIXA. On gumma of the ciliary body and syphilitic affections of the fundus. *Ibid.*, p. 123.

290. MAYER. Hemorrhagic cyst of the ciliary body ending in spontaneous recovery. *Münch. med. Wochenschr.*, xlvi, 26, p. 854.

291. HELLEBERG. A case of tumor of the iris. *Nörd. med. Archiv ny följd*, x., 3.

292. TIFFANY. Congenital irideremia. *Journ. Amer. Med. Assoc.*, April 29, 1899.

In the right eye of a woman aged twenty, suffering from chronic choroiditis, WINGENROTH (286) found a double pupil, a smaller one above and a larger one below separated by a narrow bridge of tissue. Both were round and both reacted to light. The minor circle of the iris with the sphincter surrounded each pupil unbroken. On the anterior capsule of the lens were some fine gray deposits. No coloboma of the choroid. The author discusses the possibilities in regard to the origin of this condition and brings it into connection with the membrana capsulo-pupillaris.

HANKE (287) reports on a patient who had an initial lesion seven months before and had not been treated with mercury. There had been a pustular eruption, nodules on sternum and tibia and in the testicles, and iritis and keratitis. Two months later, a quickly growing tumor, at first red and later yellow, appeared at the sclero-corneal margin and caused so much pain that it was necessary to enucleate the eye. Later, ulcerating gummata

appeared in various parts of the body. Microscopic examination showed a subconjunctival nodule near the corneal margin which was connected with the tumor in the iris and ciliary body. A lighter and a darker central portion of the tumor could be distinguished, the former representing an inflammatory infiltration, the latter beginning necrosis. No new vessel formation was observed.

The author regards the case as unique in that, together with manifestations of early syphilis elsewhere, an iritis developed with nodules which appeared to be condylomata but microscopically would be classed as products of late syphilis.

The reviewer, however, would class the nodules on the bones and in the testicles as late manifestations and the growths in the iris and ciliary body as gummata, and the entire disease as a case of so-called galloping syphilis.

SCHLIPP (288) adds another to the six cases of epithelial tumor of the iris already reported. It was found in the right eye of a girl of ten who had become blind two years before without any cause and without pain.

The ball was sunken, the tension reduced, the cornea dull, while a yellow reflex was seen in the pupil. Enucleation in 1890 and good health since. The tumor, which filled the interior of the ball, consisted of epithelial cells arranged in some places in long tubules and connected with the epithelial cells of the ciliary body from which it would seem to have arisen. Connective-tissue was wanting and the vessels were few and small.

BRIXA (289) gives a detailed clinical and pathological description of a case of syphilitic changes in both eyes in a case of malignant syphilis, and discusses the literature of the subject.

MAYER'S (290) patient was a boy of fourteen whose right eye had been injured with a shuttle six years before. Perforating wound of the sclera, prolapse of iris, excision of latter. Gradual decrease of vision. In March, 1895, L V = $\frac{6}{6}$; R with $-3.\ \frac{6}{18}$, divergent strabismus. Sclera ectatic at nasal margin of cornea, the coloboma of the iris partly filled with a dark brown opaque tumor. Lens slightly opaque and oblique in position. Vitreous and fundus normal, + T. In February, 1899, the anterior wall of the cyst was absent and there appeared only a cup displacing some of the ciliary processes. The trauma was thought to be the sole cause of the condition.

HELLEBERG'S (291) patient was a man aged forty-nine with what appeared to be a leucosarcoma of the iris and ciliary body.

The eye which was nearly blind was enucleated and the tumor proved to be localized in the iris and to have its origin apparently in the region of the sphincter muscle. This latter fact, together with the nature of the component cells—long cells with rod-like nuclei, arranged in tracts—made it appear probable that the tumor was a leimyoma, although leucosarcoma could not be excluded absolutely. DALÉN.

TIFFANY'S (292) case of irideremia, or rather rudimentary iris, was bilateral. V = $\frac{20}{100}$ −, with + 2.5 $\frac{20}{20}$. There were some nebulæ on the corneæ and in the right eye there was a string-like body attached to the posterior surface of the lens. Visual fields normal. BURNETT.

XV.—CHOROID.

293. SILEX. Round-celled sarcoma in a phthisical eye of a child aged seven, with remarks on treatment. *Zeitschr. f. Augenheilk.*, i., p. 345.

294. SCHIECK. A further contribution to the subject of leucosarcoma of the choriocapillaris. *Graefe's Archiv*, xlviii., p. 319.

295. MELLINGER. On the treatment of choroiditis of the macula. *Ophth. Klinik*, 1899, No. 10 (polemic).

296. SARADETH. A case of puerperal metastatic panophthalmitis. *Münch. med. Wochenschr.*, 1899, ii., p. 350.

SILEX (293) reported on a case of melanotic round-celled sarcoma in the phthisical eye of a girl of seven with dense opacity of the cornea. Since an exact diagnosis could not be made and signs of sympathetic irritation had appeared in the other eye, resection of the optic nerve was done, but later the eyeball protruded and exenteration of the orbit was done, three months after which the patient died. The author warns others against doing resection of the nerve in similar cases when a precise diagnosis cannot be made.

SCHIECK'S (294) patient was a man of sixty-seven who had noticed a disturbance of vision for three months; ophthalmoscopically there was a detachment of the retina. After enucleation, a choroidal sarcoma as large as a bean was found, consisting in its central part of vessels surrounded by radially arranged oval cells without much pigment, and in its periphery of a sort of capsule consisting of pigmented spindle cells.

MELLINGER (295) states, in opposition to Darier, that in some

cases he has seen subconjunctival injections of sublimate followed by injury—severe pain, necrotic foci, adhesions between conjunctiva and sclera—but such results do not follow injections of salt solutions which act by accelerating the lymph current and are quite as efficacious as mercurial injections.

SARADETH (296) saw a case of unilateral panophthalmitis develop in the course of puerperal fever. The patient recovered except for the loss of sight.

XVI.—VITREOUS.

297. GÜNSBURG. A case in which an arterial loop passed forward into the vitreous. *Zehender's Klin. Monatsbl.*, xxxviii., p. 173.

In GÜNSBURG'S (297) case the art. nervi optici passed forward 4. D into the vitreous and then arched back to the level of the retina and divided in normal fashion. There was no trace of a hyaloid artery and the eye was otherwise normal.

XVII.—GLAUCOMA.

298. ZIEM. Severe hemorrhage after iridectomy in a patient with hemophilia. *Centralbl. f. prakt. Augenheilk.*, xxiii., p. 165.

299. RUGGI. On removal of the superior cervical ganglion for glaucoma. *Il Policlinico*, vi., 10.

300. REYNOLDS. Acute and chronic glaucoma. *Amer. Journ. of Ophth.*, May, 1899.

301. AYRES. Simple glaucoma in a girl sixteen years of age, operation iridectomy, favorable result. *Ibid.*, April, 1899.

ZIEM (298) reports on a case of hemorrhage after iridectomy for glaucoma. Both eyes were operated on at one sitting and both were lost. It was found later that the patient suffered from hemophilia. This case indicates to the author that it is worth while to follow Schweigger's advice and in cases of glaucoma to operate on the poorer eye even if it is amaurotic.

RUGGI (299) repeats Abadie's arguments in regard to the theoretical effect of excising the superior cervical ganglion in glaucoma and reports five cases in which the operation was done on each side. In two cases there was sudden disappearance of the pain and signs of irritation. In one case the pain reappeared on the following day, though it was less severe. In the fourth case there

was only temporary remission of the pain, and in the fifth only a slight diminution in tension and injection. The author recognizes that the time of observation has been too short to allow any conclusions as to the final effect of the operation.

REYNOLDS (300) holds that glaucoma is not due in any way to disturbances of either the secreting or osmotic functions of the ciliary body or iris and that it is most generally a rheumatic or gouty affection of the ciliary body. His therapeusis is in accordance with these ideas. BURNETT.

AYRES (301) reports a case of simple glaucoma in a girl of sixteen who noticed failure first in the right eye two years before. Eserine was first used with benefit, but as the fields began to contract iridectomy was resorted to, which resulted in a cure. BURNETT.

XVIII.—SYMPATHETIC OPHTHALMIA.

302. BACH. Remarks on the pathogenesis of sympathetic ophthalmia. *Zeitschr. f. Augenheilk.*, I, p. 353.

303. TROUSSEAU. Tattooing of the cornea and sympathetic ophthalmia. *Ann. d'ocul.*, cxxi., 3, p. 185.

BACH (302) replies to Schirmer's criticisms and defines his standpoint, which coincides with that of Schmidt-Rimpler's, who believes in a modified ciliary nerve theory.

Sections XIX.–XXII. Reviewed by PROF. GREEFF, Berlin.

XIX.—RETINA AND FUNCTIONAL DISTURBANCES.

304. DEUTSCHMANN. Further considerations in regard to my method of treating detachment of the retina, with a report of 101 eyes thus operated upon. *Beiträge z. Augenheilk.*, 1899, p. 40.

305. LODATO. Subconjunctival injections of sodium chloride in detachment of the retina. *Arch. di Ottalm.*, iv., 1 and 2.

306. KRÜCKMANN. The pathological changes in the retinal pigment epithelial cells. *Graefe's Archiv*, xlviii., 2, p. 237.

307. WOOD, CASEY A. A contribution to the treatment of embolism of the central artery of the retina. *Ophth. Record*, June, 1899.

DEUTSCHMANN (304) reports the results of 101 cases of detachment of the retina operated on according to his method, the whole making up a volume of 226 pages. In his introduction the

author expresses his regret that the mortuary wreath has already been laid upon his operation, although he has not buried it, and has in the interval considerably developed and improved it. He formerly passed a double-edged knife as peripherically as possible from outward and downward through sclera, choroid, and retina into the vitreous, carried it somewhat obliquely through the vitreous until the opposite wall of the eyeball was reached, and then withdrew the knife, making cutting motions in each direction. Now he passes the knife through the opposite wall, perforating retina, choroid, and sclera. The conjunctiva then becomes elevated by the escape of the subretinal liquid. In this way the retina is less extensively injured and a complete evacuation of the subretinal liquid is accomplished. The knife is then withdrawn, describing a slight arch downward.

The second portion of the operation, consisting in the transplantation of rabbit's vitreous, also has been modified. The author has constructed an instrument that is both knife and canula. After a rabbit's vitreous has been removed and mixed with a sodium chloride solution, it is taken up with the knife-canula and injected into the space between the detached retina and the shrunken vitreous. The author devotes the remainder of his book to replies to the adverse criticism which has been directed against his operation by Schmidt-Rimpler, Horstmann, Intryenka, and others.

In the continuation of his paper on the anatomy and physiology of the pigment epithelial cells, KRÜCKMANN (306) takes up the pathological changes which these cells may undergo. The work is based on the fact discovered by Wagenmann, that changes in the pigment epithelium and a consecutive pigmentation of the retina occur only when the ciliary vessels are injured, and that section of the vessels of the optic nerve and retina lead to no changes in the choroid or pigment epithelium. We may always infer that circulatory disturbances exist in the choroid when pigmentation of the retina is found. Such a circulatory disturbance may be caused, for example, by endarteritis. The individual pigmented cells then suffer changes in form, in pigment contents, and in reaction to stains. The cells often become enlarged and assume unusual forms, and they may be vacuolated. The pigment granules are present only in a thin layer. Some of these cells may become restored, but most of them are cast off and lie between the retina and choroid.

An atrophy and degeneration of the retina is a necessary condition of the accumulation of pigment in the retina. Furthermore, the limitans interna must be broken through. The cast-off cells then pass into the atrophic retina.

From a study of six cases of so-called embolism of the central artery of the retina, WOOD (307) is rather inclined to be skeptical as to the value of some of the remedial agents recommended, especially massage. He is inclined to think that there may be cilio-retinal anastomoses at other localities than the disk, and that this may account for some of the cases whose sight has remained after the plugging of the central artery. BURNETT.

XX.—OPTIC NERVE.

308. AXENFELD and BUSCH. A contribution to the clinical symptomatology and histology of primary myxosarcoma of the optic nerve and on the operative removal of such tumors by Krönlein's method. *Arch. f. Augenheilk.*, xxxix., 1, p. 1.

309. ELSCHNIG. Remarks on Schnaudigel's report: A case of multiple hemorrhages of the organ of vision and the optic-nerve sheaths in particular. *Graefe's Archiv*, xlviii., 2, p. 461.

310. KIRIBUCHI. On Fuchs's peripheric atrophy of the optic nerve. *Arch. f. Augenheilk.*, xxxix., 1, p. 76.

311. GÜNSBURG. On the symptomatology and diagnosis of traumatic injuries of the optic nerve. *Wjest. Ophth.*, 1899, iii.

312. THEOBALD. A case of atrophy of the optic nerves following hemorrhage from the stomach, with a consideration of the causes of post-hemorrhagic blindness. *Amer. Journ. of Ophth.*, May, 1899.

The case which AXENFELD and BUSCH (308) reported has already been noticed in these pages, but in the present paper a table has been added showing the results of the removal of tumors of the optic nerve with preservation of the eye. Among eleven cases operated on by the older method the ball retained its normal form in only two, of the three cases operated on by Krönlein's method death occurred in one a month later from cerebral metastases, but in the other cases the eyeball was perfectly preserved.

ELSCHNIG (309) calls attention to the fact that he reported in *Graefe's Archives* (1895) two cases which supported Schnaudigel's conclusions as to the ophthalmoscopic and anatomical re-

sults of hemorrhage into the nerve sheath. He found that a considerable hemorrhage did not affect the integrity of the optic nerve and retina, or at the most caused only a slight hyperæmia of the nerve head.

KIRIBUCHI (310) finds that the portion of the optic nerve which is without fibres, lying between the pia and the peripheric septa, and concentric with the latter, is identical with the physiological neuroglia sheath of the optic nerve, which is found also about the brain and cord. It, therefore, does not represent an atrophy, as Fuchs believed. A similar neuroglia sheath is found on the surface of the larger individual bundles and about the central artery.

THEOBALD'S (312) case was a man of fifty-seven who suffered from repeated hemorrhages from the stomach. Following one of unusual severity he became "blind," and when seen more than six months afterwards the fundi presented very much the appearance of eyes which had suffered from thrombi of the retinal arteries—but associated with appearances which indicated a preceding inflammation of the optic nerve and retina. Vision limited to counting fingers very close to the eyes and over a very restricted area. The author thinks that all the appearances at the fundus after severe hemorrhages can be best accounted for by the existence of thrombus of the retinal arteries. BURNETT.

XXI.—INJURIES, FOREIGN BODIES, AND PARASITES.

313. GROENOUW. Shot injuries of the orbit with localization of the ball by means of the Roentgen rays. *Zehender's klin. Monatsbl.*, May, 1899.

314. ERB. A case of spontaneous expulsion of a piece of gun-cap from the eyeball five years after the injury. *Zeitschr. f. Augenheilk.*, vol. i.

315. NORMAN-HANSEN. When does rupture of the choroid occur after shot wounds of the temple? *Centralbl. f. Augenheilk.*, April, 1899.

316. PESCHEL. A clinical contribution to the subject of intraocular cysticercus. *Beiträge z. Augenheilk.*, xxxix., p. 68.

317. BURNETT. Removal, for persistent headache, of an ounce rifle bullet imbedded in the bones of the temporal fossa, where it had lain unsuspected for 34 years. *Journ. Amer. Med. Assoc.*, Jan. 14, 1899.

318. JAY. Foreign body in iris 32 years. *Ophth. Record*, May, 1899.

GROENOUW (313) reports on two cases of shot injury of the orbit in which he was able to localize the foreign body by means of a skiagraph. The head was illuminated through its bitemporal diameter.

ERB (314) recalls the fact that Leber showed by experiments on animals that foreign bodies of copper cause a greater reaction in the tissues than indifferent substances. The case of spontaneous extrusion of a bit of guncap from the eye of a boy of nine, five years after the injury, is therefore of interest. The small foreign body presented itself in the centre of the cornea and was easily removed.

NORMAN-HANSEN (315) comes to the following conclusions: In shot wounds of the temple choroidal rupture occurs only when the projectile strikes the eye directly. Fracture of the outer or upper wall may occur without causing rupture if the eyeball is not struck.

PESCHEL (316) reports two new cases of successful extraction of cysticercus from the eye. He concludes with geometrical considerations illustrated with twenty-one figures.

The chief point of interest in the case of BURNETT'S (317) from the oculist's point of view is the loss of sight and slow disintegration of the ball from a wound to the eyebrow by a bullet received thirty-four years ago. Apparently the eye was not touched, and the anterior part of the orbit also escaped. As the ball was found imbedded in the bones of the temporal fossa, it is assumed that there was a fracture at the optic foramen.

BURNETT.

In the case given by JAY (318) the eye had been hit by a fragment of stone or steel thirty-two years before with no injury since. Rather severe inflammation followed. There is now a grayish foreign body the size of a pin-head lying on and partly imbedded in the iris, with bands extending to the posterior surface of the cornea. No interference was allowed.

BURNETT.

XXII.—OCULAR AFFECTIONS IN GENERAL DISEASES.

319. FRAENKEL. The fundus changes in a case of pneumonia. *Graefe's Archiv*, xlviii., 2, p. 456.

320. BACH. A comprehensive description of the affections of the corpora quadrigemina and the pineal gland, with special reference to the ocular symptoms. *Zeitschr. f. Augenheilk.*, 1.

321. ZIEM. Severe secondary hemorrhage after iridectomy in a patient with hemophilia. *Centralbl. f. Augenheilk.*, June, 1899.

322. LAGLEYZE. The eye and the teeth. Pathological relations (continuation). *Arch. d'opht.*, xix., 4-5, pp. 233 and 283.

323. BISTIS. On lepra of the eye. *Ibid.*, No. 5, p. 310.

324. PARISOTTI. The value of choked disk in the diagnosis of cerebral tumors. *Bull. d. R. Accad. Med. di Roma*, xxv., 1, 2.

FRAENKEL'S (319) patient was a man of thirty-four who had an attack of pneumonia. Very early he noticed a blurring in the sight of one eye and then of the other, the entire field being obscured except the central portion. Fraenkel found five or six round white patches, a third of a disk diameter in width, scattered about the macula. Tuberculosis was suspected at first, but the fundus became normal again in the course of six weeks. The condition was similar to one described by Axenfeld, who regarded the patches as being due to the deposition of pneumococci in the retina.

BACH'S (320) paper consists of a critical résumé of all the reported cases of disease of the corpora quadrigemina. First he presents the cases in which the affection was restricted to the corpora quadrigemina, including tumors which had involved a portion of the corpora quadrigemina and cases in which they had been completely destroyed. Then follow the cases of tumor of the pineal gland, which involved the quadrigemina secondarily or compressed them.

The author believes that isolated destruction of the corpora quadrigemina does not cause disturbance of vision. In 31 of 66 cases there were changes in the optic nerves, usually choked disk. Symmetrical paralyses of the ocular muscles are characteristic of disease of the corpora quadrigemina.

ZIEM (321) performed iridectomy on both eyes of a man of sixty-two for inflammatory glaucoma. There was moderate hemorrhage into the anterior chamber. Two days later severe pain was felt in the night, and fresh blood appeared daily on the dressings. The eye was lost. There was also bleeding from the nose.

Since his childhood the patient had always bled profusely after any trivial injury.

LAGLEYZE (322), in the continuation of his paper, speaks of the affections of the teeth (mostly alveolar osteoperiostitis) which cause complications on the part of the eyes and orbits, and discusses the various ways of transmission. The inflammation is transmitted immediately to the eye by the periosteum or bone, or through the canals in the bone for the passage of vessels and nerves. It may also lead to disease of a sinus, causing phlegmon or phlebitis of the orbit. According to the author, the infection has not been shown in any case to have followed the lymph vessels.

The author also believes in a direct action by diffusion of toxins in the veins of the affected side of the head.

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BISTIS (323) describes the ocular changes in 27 lepra patients. In the tuberculous form the eyebrows and lids are attacked frequently and early, with loss of the lashes and ectropium or entropium. When the orbicularis muscle is affected, lagophthalmus results, as it does also in the anæsthetic form. The tarsus was never involved, nor was the conjunctiva, and the nasal duct suffered only in one case. The cornea was frequently attacked, there being pannus and nodules which grew very large and led to phthisis. There were also round, gray spots in the cornea beneath a normal epithelium. These were mostly bilateral and accompanied by a mild iritis. Primary lepra nodules in the cornea are infrequent.

The iris and ciliary body are involved usually in the form of chronic iridocyclitis. Iritis without a corneal affection is rare. Leprous tumors of the iris were not observed. The vitreous was affected frequently, the fundus rarely. Iridectomies and cataract extractions when the cataract was not complicated with iridocyclitis were successful.

v. MITTELSTÄDT.

BOOK NOTICES.

(*Continued from page* 609.)

XXXI. System of Diseases of the Eye by American, British, Dutch, French, German, and Spanish Authors. Edited by WILLIAM F. NORRIS, A.M., M.D., and CHARLES A. OLIVER, A.M., M.D. Vol. IV. Motor apparatus, cornea, lens, refraction, medical ophthalmology. 8vo., pp. 949. With 51 full-page plates and 211 text illustrations. Philadelphia and London: J. B. Lippincott Company, 1900.

The general impression that one gains in first looking through this final volume is that it excels some of the preceding volumes of the system in the evenness and uniform excellence of its papers, and in the care with which the translations have been done. There is greater similarity in the treatment of the different subjects than is usual in text-books of composite authorship. The papers, without being discursive and tedious, are as complete as one could wish. Recent literature has been taken fully into account, and ancient history has been greatly curtailed or omitted. The result is a practical and readable book, and one of exceptional value.

The first and longest paper, on the "Anomalies of the Motor Apparatus of the Eyes," 166 pages, by Landolt, is an amplification of his well-known paper in the *Traité complet d'ophthalmologie*, and requires no comment. In the next paper, on "Diseases of the Cornea," 88 pages, by Nuel, the modern conceptions of the pathology of corneal diseases are clearly presented, and many of the illustrations are new and valuable. "Ametropia: its Etiology, Course, and Treatment," a paper of 80 pages by Oliver, contains many points of practical interest which are too briefly passed over in the ordinary text-books. "Diseases of the Lens" are discussed by Norris in a profusely illustrated paper of 140 pages. Many of

the photomicrographic reproductions, however, are not very convincing, and, as illustrations, are not up to the high standard of the text.

Haab, in a paper of 55 pages, treats in detail of the ocular lesions dependent upon diseases of the circulatory system; Lawford, in a paper of 40 pages, of those dependent upon disorders of the secretory and excretory organs (chiefly Bright's disease and diabetes); Story, in a paper of 15 pages, of ocular lesions in smallpox, erysipelas, diphtheria, and the like; and Santos-Fernandez, in a paper of 20 pages, of those due to influenza, malaria, yellow fever, etc. Jonathan Hutchinson, Jr., has 8 pages on eye affections due to Graves's disease and herpes zoster; and Salzmann devotes 17 pages to the entozoa of the eye.

One of the most valuable papers in the book is that by Swanzy on "Eye-diseases and Eye-symptoms in their Relation to Organic Diseases of the Brain and Spinal Cord." It is valuable because no work yet available exhibits an equal depth of research, and discrimination in the selection of material. Those who studied with profit the author's Bowman lecture on this subject, a dozen years ago, will not be disappointed in this ampler presentation. The subject of hysteria is thoroughly discussed by Parinaud in a paper of 42 pages; and simulated blindness, with equal thoroughness, by Baudry in a paper of 45 pages. De Schweinitz, in a paper of 47 pages, gives a clear account of the toxic amblyopias, slightly more condensed than his prize essay on the subject.

In a paper of 15 pages on the "Motor Changes in the Ocular Apparatus Associated with Functional Neuroses," Standish takes up the subject of the cure of chorea and epilepsy by tenotomy of the ocular muscles. Such papers are expected to strain the reader's credulity somewhat, but the author here would hardly go so far as to wish us to believe that he had cured an asthenopia arising from exophoria, by doing a graduated tenotomy of one *internal* rectus, as he states on page 785, below; and it is, therefore, only charitable to assume that in this account the type-setter has mixed things up.

The last paper is one of 12 pages by Gayet on "The Ocular Signs of Death." Although the author shows that none of the reputed ocular tests of death is uniformly certain, yet as a chapter of medical history this paper will not be found uninteresting by those who are curious of such things. W. A. H.

XXXII. **Optics; A Manual for Students.** By A. S. PERCIVAL, M.A., M.B., Trinity College, Cambridge. The Macmillan Co., London and New York, 1899. $3.25.

We confess to a feeling of considerable satisfaction in taking up a text-book upon optics—even one intended for the practising ophthalmologist—which begins at the beginning, *i. e.*, with a study of the wave-theory of light. The principles of the wave-theory are by no means difficult to grasp; they require no abstruse mathematical knowledge for their mastery; and, once acquired, they furnish the key to all the facts of refraction and reflection, and that too in the most satisfactory manner and without the employment of anything more than the elements of mathematics. This fact, while disregarded by most writers upon elementary optics, is of considerable scientific importance. It is exceedingly well demonstrated in this work of Percival's, and, indeed, we may say that we know of no book containing a more lucid and, for the most part, simple explanation of the wave-theory and the deductions made from it.

Starting with these deductions, Percival carries the reader along in logical progress, considering in succession the subjects of reflection from plane and curved surfaces, the size of the reflected image, and the aberration of images formed by spherical surfaces; refraction by plane surfaces including a full description of the phenomena of deviation and dispersion produced by prisms; and refraction by spherical surfaces including a discussion of the theory of lenses, of the distance and character of their images, and of spherical and chromatic aberration; and winds up with a very useful and instructive chapter upon the optics of the human eye, both normal and abnormal, including sections on aphakia, the determination of the refraction by the ophthalmoscope and shadow-test, on the meaning of the terms angle α, γ, and $\varkappa$, and on prismospheres. The treatment of these subjects is clear and satisfactory, and, for the most part, makes no undue demands upon the reader's mathematical knowledge. Certain chapters, however, notably those upon aberration and caustics, presuppose a knowledge of the calculus; although, it may be added, these chapters are in themselves of subsidiary importance, and they are not necessary to their context, so that they can be omitted by the student without injury.

We are glad to see that the author has made use of the theorems of Gauss in discussing the theory of lenses that have an

appreciable thickness. These principles, admirable alike for their simplicity and their universal applicability, should, in our opinion, form the very starting-point of all discussions upon lenses or refracting systems in general; and we think it a distinct mistake to do as Percival, following most authors, has here done, and consider first the laws applying to infinitely thin lenses, and then discuss as a separate proposition lenses and refracting systems of appreciable thickness. Gauss' laws are as applicable to one as to the other, and infinitely thin lenses should be regarded as only special varieties of lenses in general, and their theory as constituting only a special application of Gauss' laws. These laws, by the way, lend themselves admirably to geometrical demonstration. The determination of the cardinal points in lenses of all kinds and shapes, the principles regulating the combination of two or more lenses, and the laws governing the size, shape, and position of images, may in general be worked out from Gauss' theorems by means of simple geometrical diagrams, without having to call in the aid of any complex formulæ or of any trigonometrical calculations whatever. This fact has been repeatedly verified in teaching optics to ophthalmological students.

The book, besides its theoretical discussions, contains scattered through it numerous facts and deductions of practical value, which should commend it to the ophthalmologist as well as to the student. Not the least valuable feature is the introduction, in and at the end of each chapter, of examples and problems, the working out of which will not only confirm the student in the comprehension of what he reads, but will also illustrate to him the practical usefulness and applicability of the principles that he has been studying.

The author is to be congratulated upon having produced a compact, handy, and useful as well as full and accurate text-book. A. D.

XXXIII. **Hand-book of Optics, for Students of Ophthalmology.** By WILLIAM NORWOOD SUTER, B.A., M.D., Washington, D. C. The Macmillan Co., New York, 1899. 13 x 19 c. m., pp. viii. + 209. Index. $1.00.

This book may be presented to the student as containing that of optics which is necessary and sufficient for one about to study ophthalmology as a science and to practise it as an art. If, as the author suspects, "some of the demonstrations appear formidable," let it be remembered that they are necessary as well as

sufficient, and they have seldom been presented in a more elegant and accessible form.

This text-book, in English, brief, clear, and important, should be welcomed by both teachers and students. Now a word about the difficulties. There are not very many. An algebraic expression is not necessarily intricate because it reaches across the page. It is no disgrace to one who has been some years busy with science less formal, if not less exact, that he should hesitate a little at high-school algebra, or draw back from sines and similar functions, and as for continued fractions he may have forgotten their existence. But it is a disgrace that he should try to practise all-round ophthalmology without the mathematical and optical equipment which is here offered. By means of slipshod illustrations and imperfect analogies he may totter through an easier course and gain what he thinks is the same thing, but he will be mistaken.

An hour or two spent in review of the three topics just mentioned will have a marvellous effect in clearing away the difficulties for those who are afraid of the formulæ.

It is absolutely necessary that the student should know the dioptrics of the eye to which one spectacle lens has been added, and that he should be able to join to this system an ophthalmoscope, an ophthalmometer, or some similar instruments, without losing track of the relations that exist between object and image. This, and more, he is taught to do, by a method that will not break down under the requirements of the art.

The first part of the book is devoted entirely to geometrical optics, beginning with refraction according to Snell's law at one plane surface, then showing the changes that must take place in the pencil conditioned by circumstances of curvature and by additional surfaces. This, of course, includes the theory of the lens with its cardinal points and planes, the determination of focal lengths, and the sizes and positions of conjugate images. Chapter III. applies foregoing principles to just that combination of surfaces that is found in the human eye, and by the help of well-known constants determines its cardinal points, giving numerical results in a table. After this enough of the theory of equivalent lenses is introduced to explain the schematic eye of Listing and that of Donders. Another chapter adds one lens to this system, after which the reader is ready to consider "Errors of Refraction" and "Lenses Used as Spectacles."

Chapter VII. gives much-needed information on the subject of "The Effect of Spherical Lenses on the Size of Retinal Images." Two chapters are devoted to cylindrical glasses, alone or in combinations; one to their so-called "twisting properties," one to "tilted lenses," one to prisms, with a word or two on the distortions caused thereby. The closing chapters deal very briefly with skiascopy, the ophthalmoscope, and the ophthalmometer, perhaps not too briefly, for the student who has profited by the previous pages is quite capable of taking care of those subjects himself.

W. S. D.

Obituary.

Dr. M. BORYSICKIEWICZ, Professor of Ophthalmology at the University of Graz, Austria, died September 18, 1899, in his fifty-first year. He was formerly assistant at Stellwag's clinic in Vienna, and famous as a skilful operator. His investigations on the finer structure of the retina are well known.

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20. V. FUKALA (Vienna). Dioptrics of the ancients.

21. H. WOLFF (Berlin). Symblepharon operation.

22. M. MOHR (Buda-Pesth). Keratosis of the conjunctiva.

23. L. WEISS and W. KLINGELHÖFFER (Mannheim). Occurrence of ruptures of the iris.

24. A. BIETTI (Parma). The elastic tissues in the human eye.

25. O. WALTER (Odessa). Open treatment of ocular operations.

26. ABELSDORFF's translation of the Ophthalmological Section of the New York Academy of Medicine :

Sitting of January 16, 1899. W. B. JOHNSON, A. KNAPP, A. E. DAVIS, R. DENIG, S. M. PAYNE, H. D. NOYES (paper on muscular insufficiencies), H. KNAPP.

Sitting of February 20, 1899. H. KNAPP, J. E. WEEKS, W. E. LAMBERT, J. H. CLAIBORNE, W. A. HOLDEN.

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27. L. Weiss and W. Klingelhöffer. On the value of the Roentgen rays in ophthalmology.

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28. M. Botwinnik (St. Petersburg). Changes of astigmatism by physical and physiological influences.

29. L. de Wecker (Paris). Aseptic tatooing of cornea.

30. Ed. Pergens (Brussels). Remarks on Fukala's dioptrics of the ancients.

31. S. Ginsberg (Berlin). Herpes zoster ophthalmicus.

32. L. Pick (Königsberg). Tortuositas vasorum.

33. Abelsdorff. Translations of the original papers in the Arch. of Ophth., vol. xxviii., No. 1 (G. T. Stevens. Rosa W. Straus, H. Derby).

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1. Hillemanns (Duisberg). Ulcus corneæ rodens.

2. L. Müller (Vienna). The Egyptian ophthalmiæ.

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4. Fr. Falchi (Pavia). Congenital anomaly of bulbar conjunctiva.

5. R. Greeff. Report on the Ninth International Ophthalmological Congress at Utrecht, first part (translation in this number, p. 661).

6. O. v. Sicherer. Report on the Ophthalmological Section at the German Association of Naturalists and Physicians in Munich, September 17–23, 1899.

7. Listing's Report on the Ophthalmological Section of the British Medical Association (this number, p. 644). Translated by Abelsdorff.

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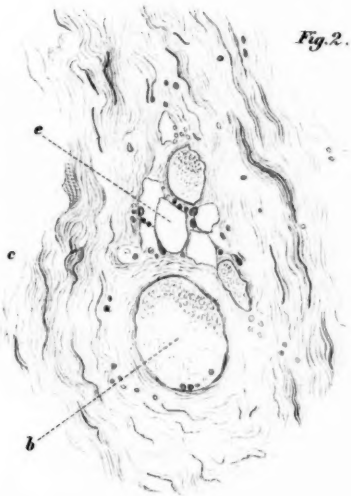

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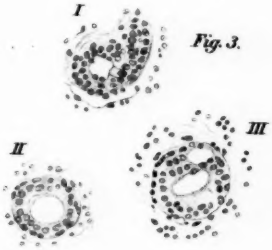

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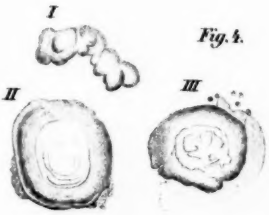

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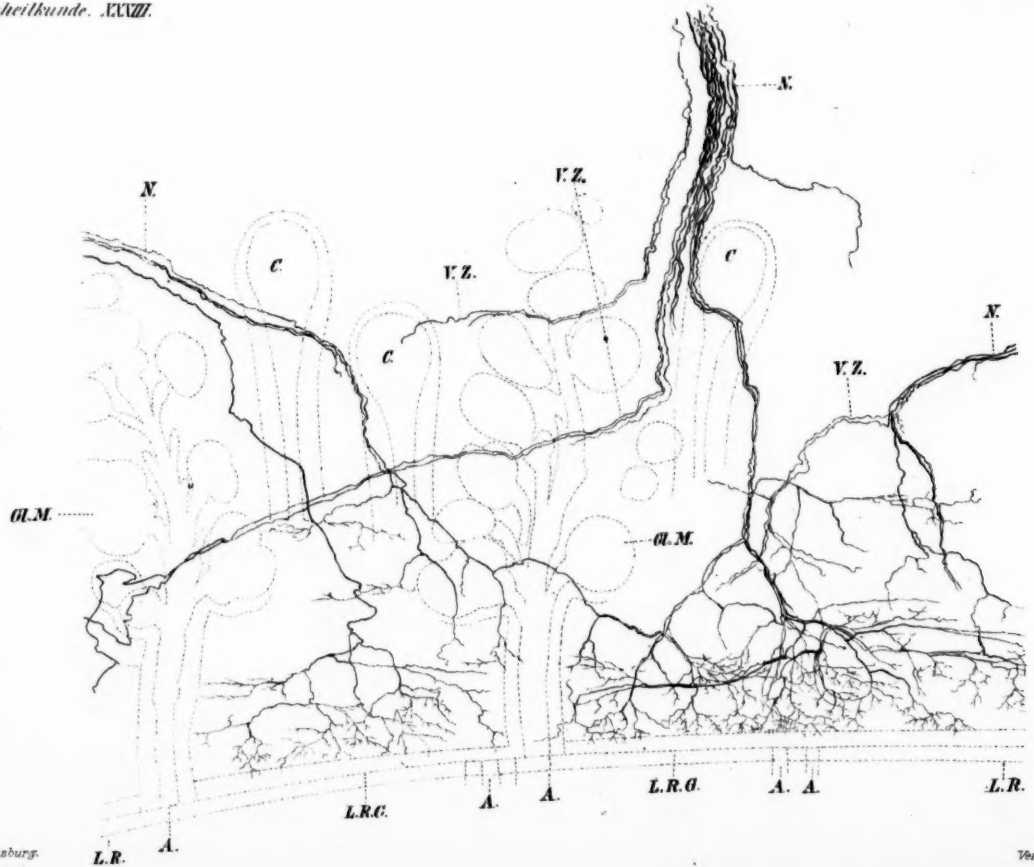

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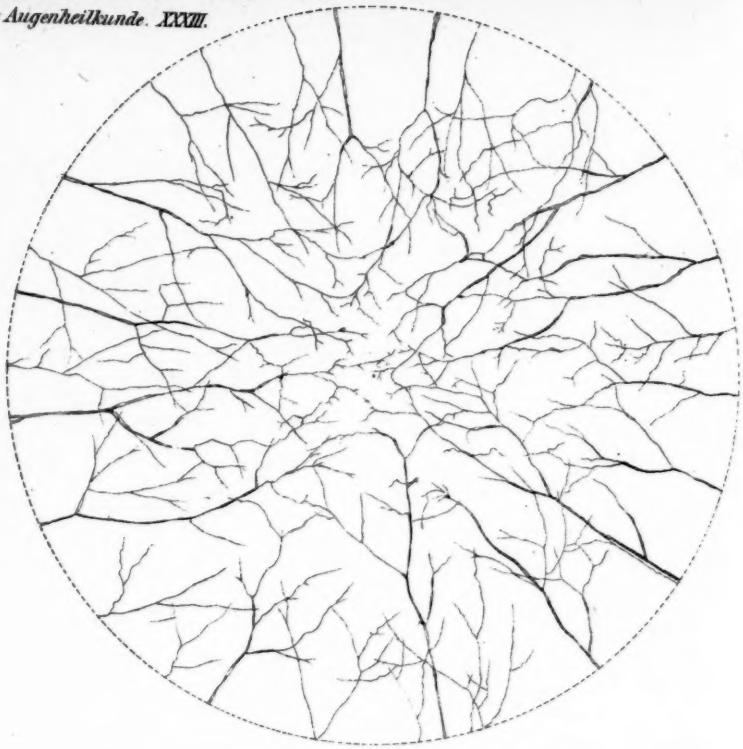

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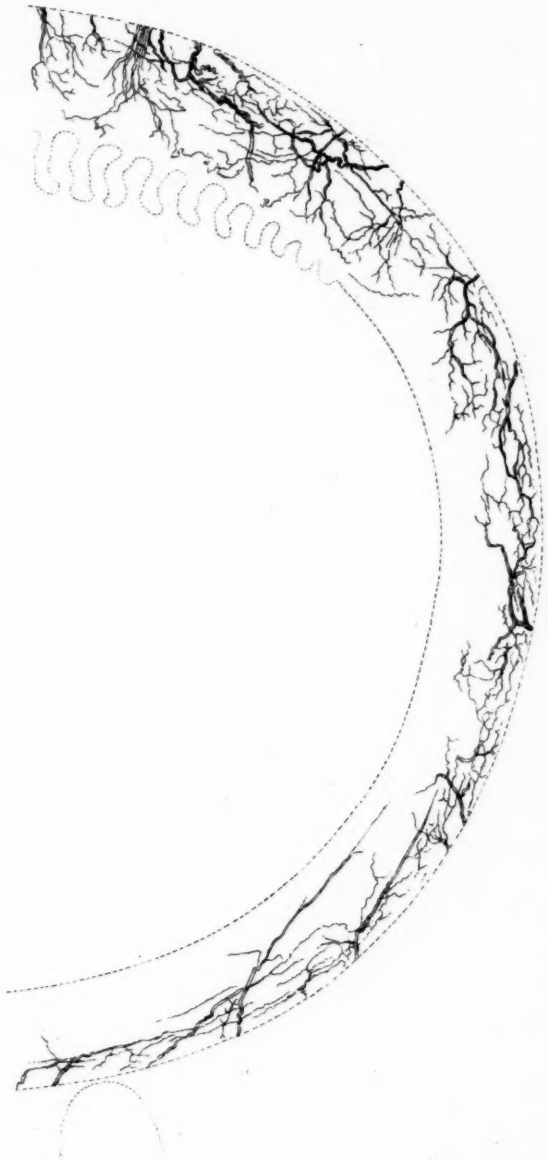

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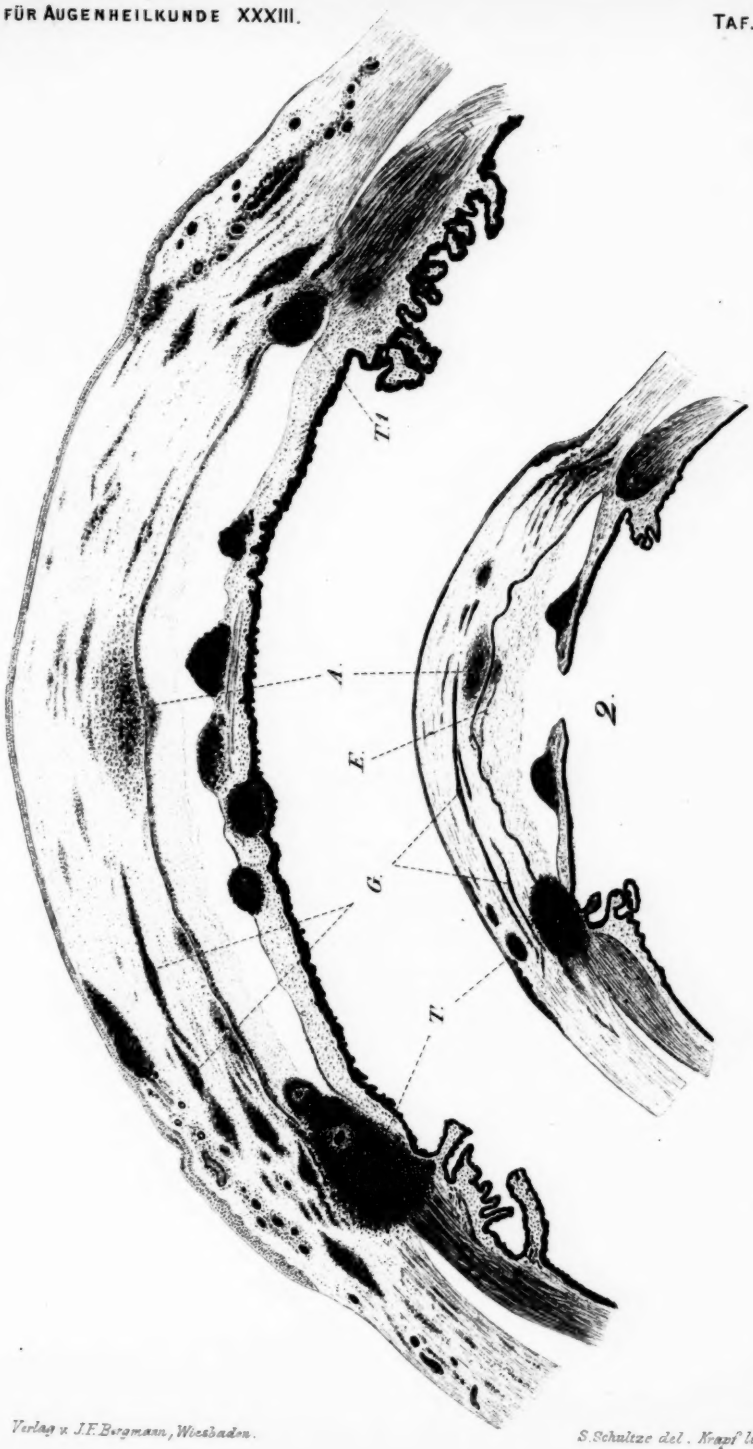

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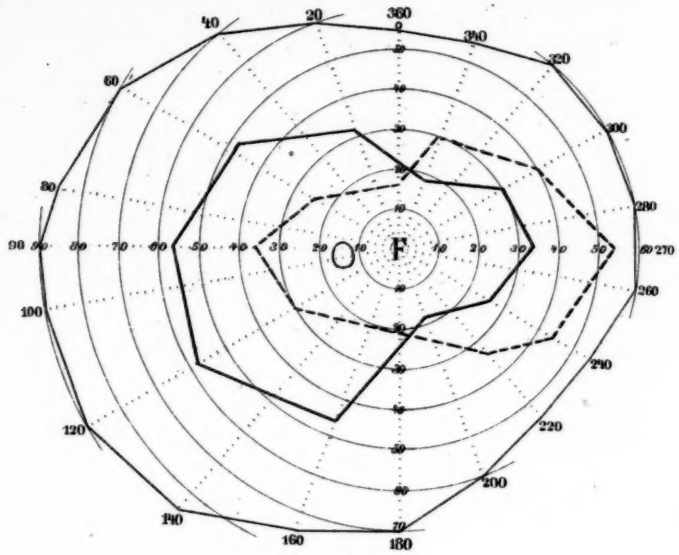

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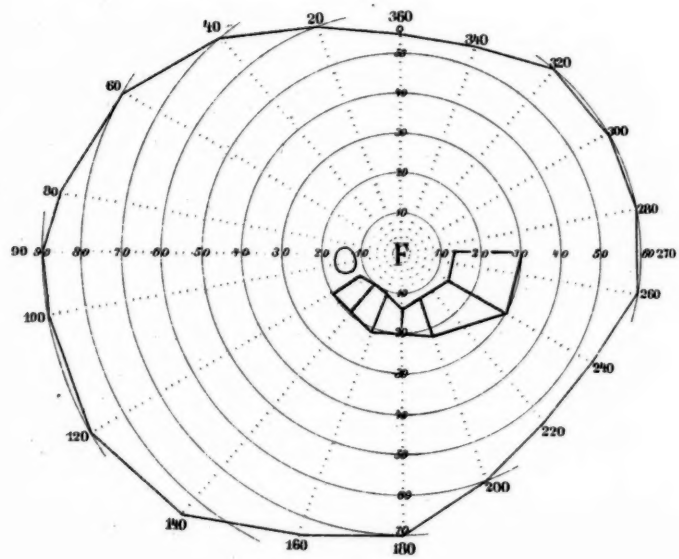

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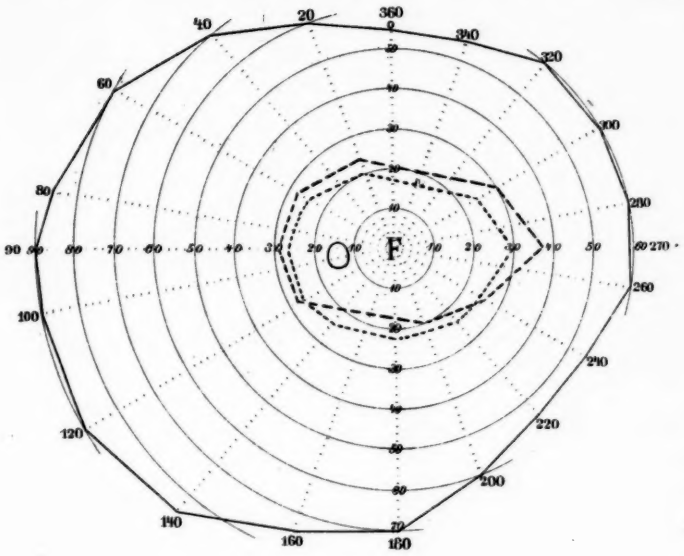

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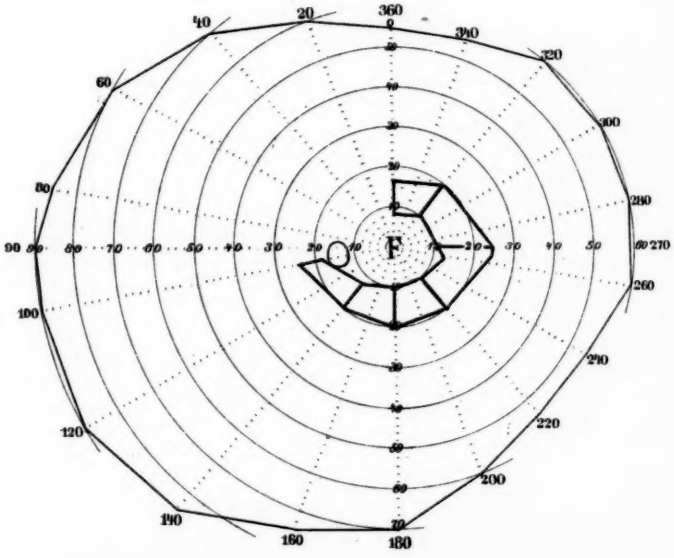

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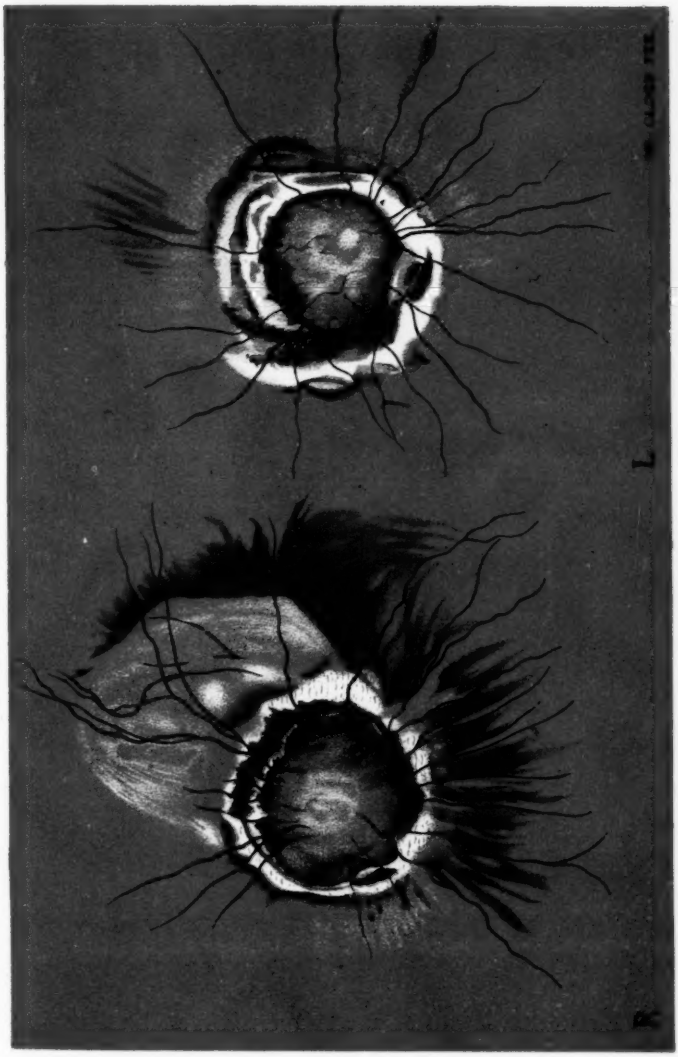

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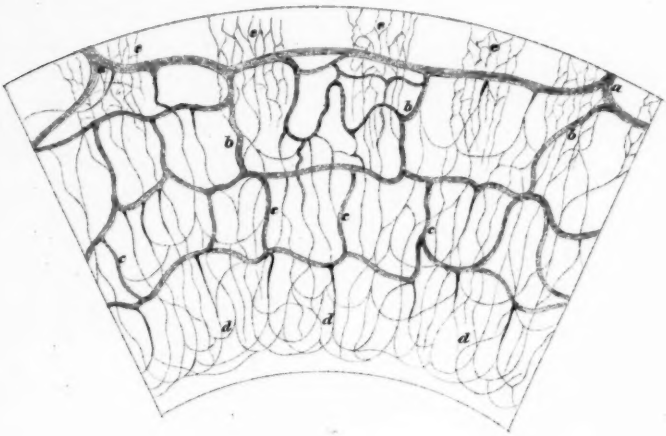

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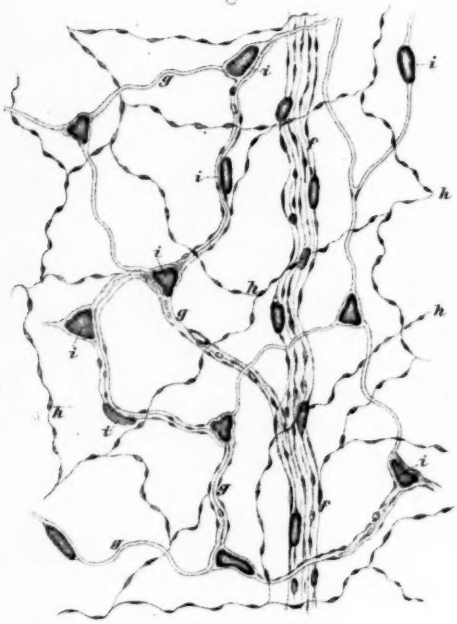

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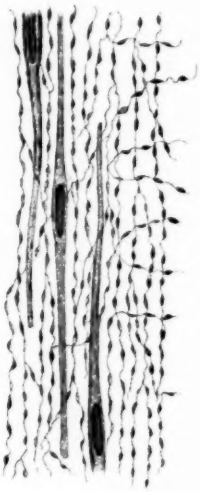

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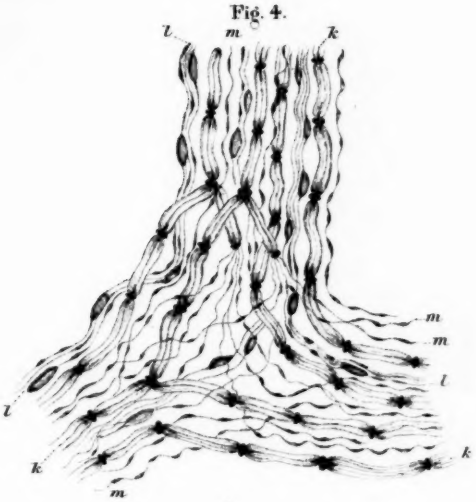

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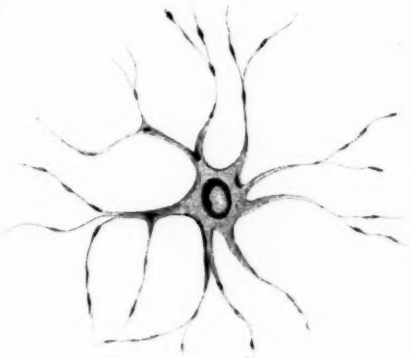

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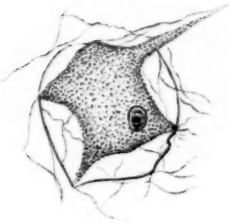

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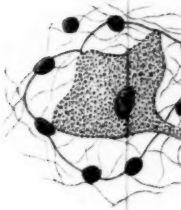

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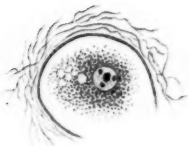

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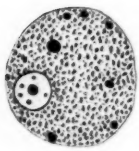

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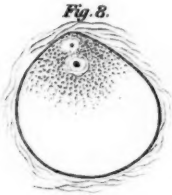

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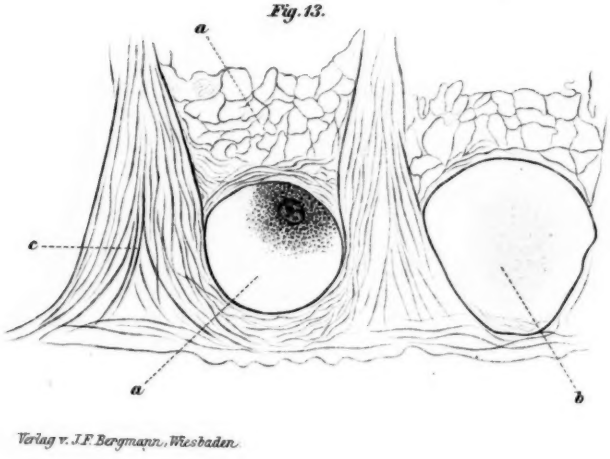

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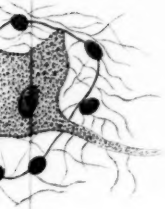

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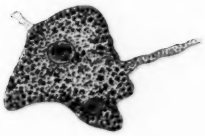

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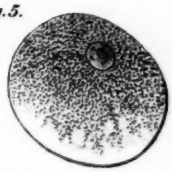

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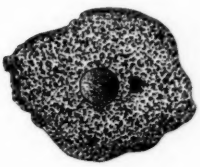

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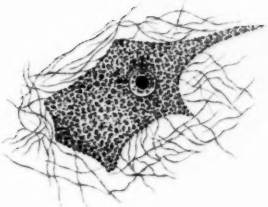

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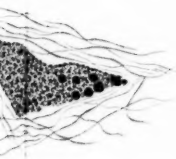

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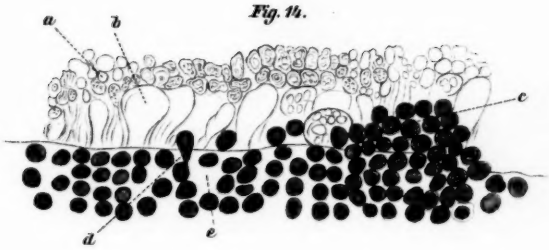

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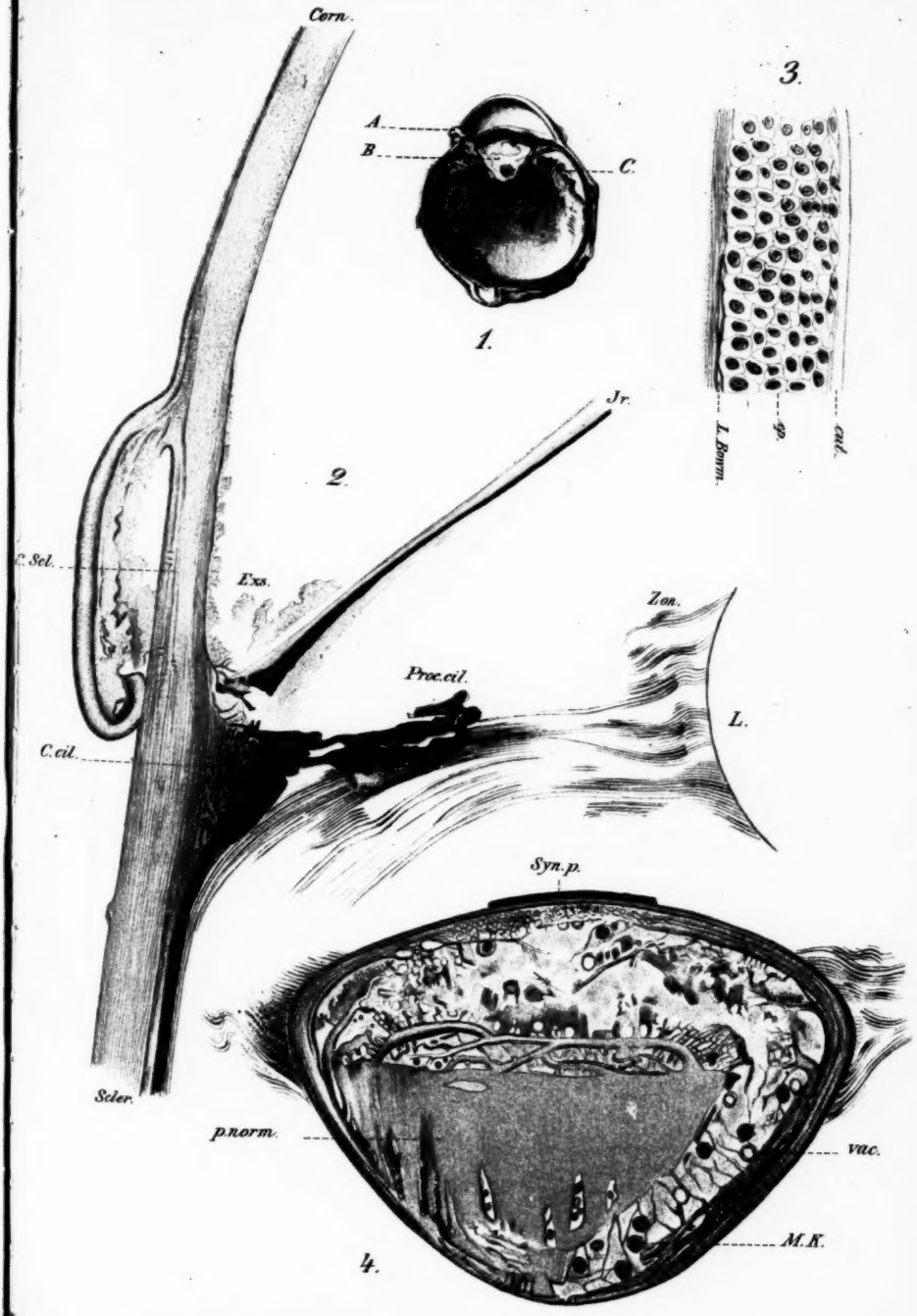

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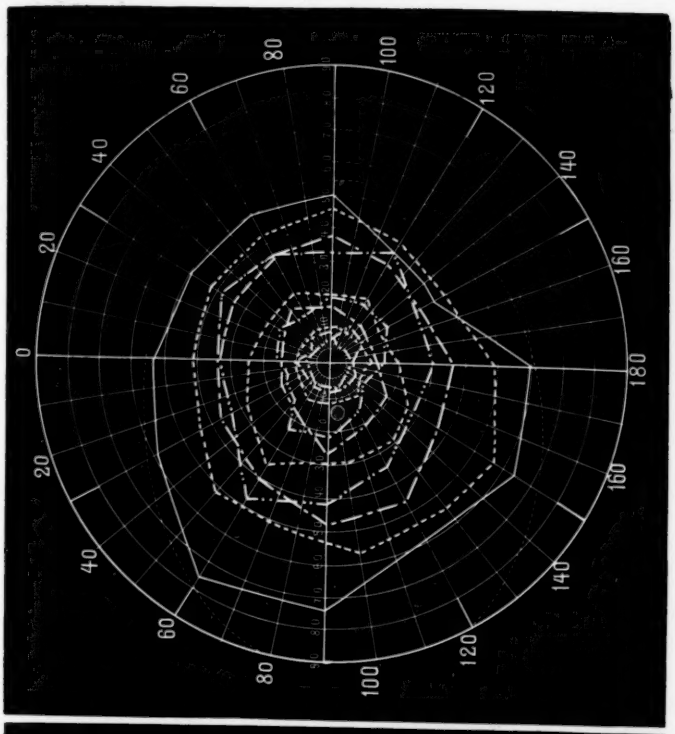

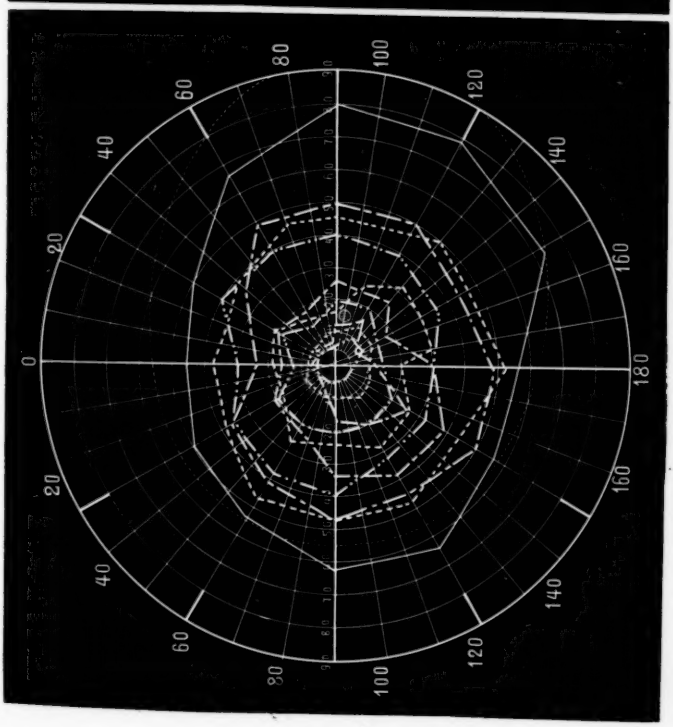

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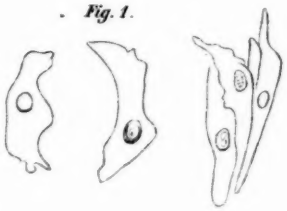

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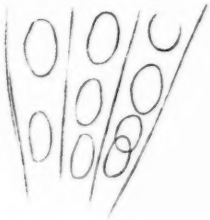

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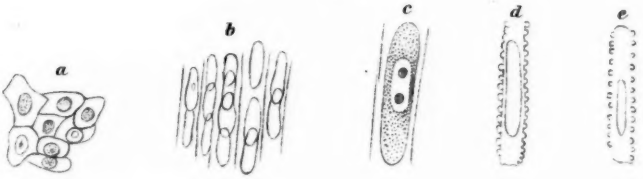

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EDITORIAL NOTE.

In asking for continued support of the ARCHIVES from subscribers and contributors, the Editors offer no new program, but point to the record of the work that has been accomplished during the past twenty-eight years. At the first appearance of the ARCHIVES in 1869, they constituted the only periodical of their class in America, and had only a few predecessors in Europe. The international character of the ARCHIVES was a novel and distinctive feature.

The original program of the ARCHIVES to publish only original papers in semi-annual independent numbers has, in the course of years, been extended by the addition of reviews of the current ophthalmological and otological literature.

With the eighth volume, in 1879, the combined ARCHIVES, issued semi-annually, were divided into two separate journals, issued quarterly, and each of about the same size as the combined journal, and the reviews were converted into quarterly reports, systematic and comprehensive, though concise, on the progress of ophthalmology and otology.

Since that date, the ARCHIVES have developed into an extensive and conveniently arranged storehouse of knowledge for the instruction of the student and for reference by the practitioner and the investigator.

For more than ten years, the valuable material offered to the ARCHIVES has been so abundant that it has not been practicable to utilize for the English edition the full series of papers from the German, or the converse. Many articles had to be abridged, while of others abstracts only could be printed. Any one of our readers could, however, have secured, and can secure in future, from the American editors, or the German publisher, the loan of the original papers presenting the complete text.

It is the purpose of the editors to arrange, in the department of Reports, for the review of every publication which in their opinion contains material that can be called distinctive and important. It is, of course, impossible, within the limits of the ARCHIVES or of any similar journal, to give attention to every publication in their department of science. We may state further that it is not a part of our program to furnish a complete report on the *bibliography*, but only on the **progress** of ophthalmology and otology.

Though the systematic arrangement of the reviews is of importance for reference and comprehensive information, we shall publish, as early after the meetings as practicable, reports of the proceedings of societies, always bearing in mind that the ARCHIVES are not intended to be only a repertory of knowledge, but also a journal of news.

It is natural that the English edition of the ARCHIVES should give the advantage of time and space to Anglo-American contributors over the German, and *vice versa*. It is evident, however, that the association of the two editions lends strength to each, furnishing to the authors a wider circulation for their papers, and to the readers a larger and more diversified field of information.

ARCHIVES OF OPHTHALMOLOGY

NOTICE TO OUR READERS.

The ARCHIVES OF OPHTHALMOLOGY contain only **original papers** on all branches of ophthalmic surgery, and **original reports** on the progress of ophthalmology. The original papers occupy from two thirds to three fourths of the space, and their scope embraces all subjects of scientific and practical interest connected with this department of medicine.

The object of the ARCHIVES is to guard, solidify, extend, and diffuse the stock of acquired ophthalmic knowledge by recording the constant addition of new observations, investigations, methods and means of examination, clinical experience, instruments and remedies, and further by taking part in the discussion of the questions of the day with a spirit alike conservative and progressive.

Particular attention is paid to the preparation of the **Report on the Progress of Ophthalmology.** The report is intended to furnish *a complete, systematic, and early* review of what, in the opinion of the editors, is valuable in the current ophthalmological literature of the world. It has been necessary to divide the work of its preparation among a number of collaborators according to the following arrangement :

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In order to obtain complete and recent reviews on the ophthalmological literature of the world, **special reporters** have been selected for different countries, who will send quarterly abstracts of all local ophthalmological publications to **Dr. C. Horstmann,** of Berlin, the **editor of the Report.** Dr. Horstmann will distribute these abstracts among the **general reporters** according to the above plan, in order to preserve the systematic arrangement which we consider to be of paramount importance.

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In the interest of our readers, who are scattered over the whole world—and whom, like ourselves, we desire to keep informed of all advances in ophthalmology,—furthermore in their own interest, authors of ophthalmological works are requested to send reprints, duplicates of journals, or books for reviewing, to one of the above-named reporters, or to the editors or publishers of the "Archives," according to their convenience.

The abstracts of American ophthalmological literature formerly appeared under a special head, but are now embodied in the systematic Report. Text-books may be specially noticed.

The number of good papers offered us for publication has increased to such an extent that it is no longer possible to translate all of them unabridged. **Whenever a German paper is condensed in the English version, or** *vice versa*, **it will be so stated. Should any one of our readers wish to recur to the original, the editors will always take pleasure in sending it for reference.**

Under the heading of **Miscellaneous Notes,** there will be published all kinds of professional news which specially concern the oculist, *e. g.*, appointments, honors, resignations, vacancies, new ophthalmic hospitals, opportunities for instruction, prize questions and essays, announcement of Society meetings, etc. Brief notices of this kind will be thankfully received by the editors.

Original papers of value from any source will, as heretofore, be welcome to the "Archives," and are solicited.

EDITORS:

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The editors and publishers of the ARCHIVES beg to offer some suggestions to authors who propose to favor them with their contributions.

1. As original communications the ARCHIVES can accept only such papers as have never been printed nor are intended to be printed in other journals. If a preliminary communication on the subject of a paper has been published, the author is requested to state this in the letter accompanying his manuscript. It is understood that contributors to these ARCHIVES and editors of other periodicals will make no abstracts of original papers published in this journal without giving it due credit for the same.

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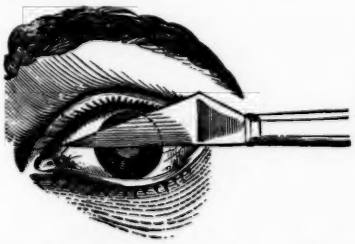

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